Supreme Court, U. S.
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MICHAEL RODAK, JR., CLERK

Appendix

In the Supreme Court of the United States

OCTOBER TERM, 1977

No. 76-1701

TENNESSEE VALLEY AUTHORITY, PETITIONER

v.

HIRAM G. HILL, JR., ET. AL.

ON WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE SIXTH CIRCUIT

PETITION FOR A WRIT OF CERTIORARI FILED MAY 31, 1977
CERTIORARI GRANTED NOVEMBER 14, 1977

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DOCKET ENTRIES—District Court

Proceedings	
1976	
Feb. 18	Complaint filed.
Feb. 18	Motion for an expedited hearing, filed.
Feb. 18	Summons issued and handed Marshal for service.
Feb. 18	Order that defendant show cause why the temporary injunction sought in the complaint should not be granted, February 25, 1976 at 9:00 a.m., filed. Service by Clerk.
Feb. 19	Summons returned served on Aubrey Wagner for TVA on February 18, 1976, filed.
Feb. 23	Motion to dismiss, filed. Service by TVA.
Feb. 23	Brief of TVA in support of motion to dismiss and in opposition to motion for injunction, filed.
Feb. 25	Brief of plaintiffs in support of motion for temporary injunction and in opposition to defendant's motion to dismiss, filed. Service by counsel.
Feb. 25	Plaintiff's motion for temporary injunction heard and denied, memorandum and order to follow. Defendant's motion to dismiss heard and denied, memorandum and order to follow. Case set for trial April 23, 1976, Order Book 73, page 170.
Feb. 25	Subpoena returned served by phone and mail on one plaintiff witness at Nashville on February 24, 1976, filed.
Feb. 26	Opinion as rendered from the bench, filed. Service by Clerk.
Feb. 26	Order that plaintiffs' motion for a preliminary injunction be denied and TVA's motion to dismiss at this time is denied, entered in Order Book 73, page 185 and filed. Service by Clerk.
Mar. 3	Subpoena returned personally served at Knoxville on one plaintiff witness on February 25, 1976, filed.
Mar. 9	Subpoena returned served on one plaintiff witness at Washington, D.C. on February 24, 1976, filed.
Mar. 17	TVA's stipulation of facts, filed.
Apr. 12	Order pursuant to pretrial, filed. Service by Clerk.
Apr. 20	Trial brief of TVA, filed.
Apr. 20	Tennessee Valley Authority's Proposed Findings of Fact and Conclusion of Law, filed. Service by TVA.
Apr. 21	Trial brief on behalf of plaintiffs, filed.
Apr. 22	List of witnesses which plaintiffs propose to use at trial, filed. Service by counsel.
Apr. 22	Exceptions to pretrial order on behalf of plaintiffs, filed. Service by counsel.
Apr. 23	TVA's objections to plaintiffs' list of witnesses, filed. Service by counsel.

Apr. 23	TVA's opposition to plaintiffs' exceptions to pretrial order, filed. Service by counsel.
Apr. 23	Order modifying and altering the pretrial order, filed. Service by Clerk.
Apr. 27	Findings of fact and conclusions of law on behalf of plaintiffs, filed.
Apr. 28	Order amending pretrial order to add two plaintiffs, filed.
Apr. 28	Supplement to trial brief on behalf of plaintiffs, filed. Service by counsel.
Apr. 29	Deposition of Dr. Royal D. Suttkus, filed.
Apr. 29	Order of trial without the intervention of a jury. Plaintiff introduced its proof and rested. Defendant introduced its proof in part. The time of adjournment having arrived, Court adjourned until 9:00 a.m. Friday, April 30, 1976, Order Book 73, page 421.
Apr. 29	Exhibits 1 through 109.
Apr. 30	Deposition of Richard Fitz, filed.
Apr. 30	Deposition of Gary David Hickman, filed.
Apr. 30	Deposition of Edward C. Raney, filed.
Apr. 30	Deposition of Herbert T. Boschung, Jr., filed.
Apr. 30	Defendant continued its proof to conclusion and rested. Plaintiff offered rebuttal testimony. Argument of counsel. Court took under advisement, counsel to submit briefs by May 6, 1976, Order Book 73, page 423.
Apr. 30	Exhibits 110 through 115, filed.
May 6	Post-trial brief on behalf of plaintiff, filed.
May 6	Post-trial brief of TVA, filed. Service by TVA.
May 11	TVA's Brief in reply to plaintiff's post-trial brief, filed. Service by counsel.
May 11	Reply brief on behalf of plaintiffs, filed. Service by Counsel.
May 19	Clerk's copy of Transcript of Proceedings on Plaintiffs' Motion for Preliminary Injunction Wednesday, February 25, 1976, filed.
May 25	Memorandum, R. L. Taylor, D.J., filed. Service by Clerk.
May 25	Order denying plaintiffs' request for a permanent injunction and dismissing action on the merits entered in Order Book 74, page 32 and filed. Service by Clerk.
June 2	Notice of appeal, filed. Certified copy to TVA by Clerk.
June 2	Bond for costs on appeal, filed.
June 3	Motion for injunction pending appeal from order denying injunction, filed. Service by counsel.
June 3	Brief in support of motion for injunction pending appeal, filed. Service by counsel.
June 9	Response of TVA to Plaintiff's motion for injunction pending appeal, filed. Service by TVA.
June 9	Affidavit of George H. Kimmons, filed.
June 9	Brief on TVA in opposition to injunction pending appeal, filed.
June 10	Order denying plaintiff's motion for an injunction pending appeal, entered in Order Book 74, page 96 and filed. Service by Clerk.

June 21	Designation by appellants of transcript for appeal, filed.
July 9	Order granting additional time of 90 days for filing record on appeal from date of filing notice of appeal, filed.
July 28	Order, U.S. Court of Appeals, granting motion for injunction pending appeal, filed. Service by Clerk Hehman.
Aug. 4	Order modifying Order of July 28 from U.S. Court of Appeals, so as to enjoin, pending appeal, any closure of the dam, filed. Service by Clerk Hehman.
Aug. 23	Transcript of proceedings, Volumes I and II, filed.
Aug. 25	Certified record on appeal mailed to Sixth Circuit Court of Appeals.

DOCKET ENTRIES—Sixth Circuit

Filings—Proceedings

July 1	Motion for Injunction Pending Appeal. (p–7/7) Brief in Support.
July 1	Motion for Expedited Hearing. (p–7/7) Brief in Support.
July 13	Response to motion for injunction pending appeal.
July 13	Response to motion for expedited hearing.
July 26	Order granting motion for injunction pending appeal and directing that the case be set for oral argument in the October 1976 session (Weick, J.) RR–6.
July 26	Certified copy of above order issued to the District Court.
July 29	Motion of appellees for reconsideration of 7/26 order granting injunction pending appeal.
Aug. 2	Order modifying injunction of July 26, 1976 (Weick, J.) SS–1.
Aug. 2	Certified copy of above order issued to the District Court.
Aug. 31	*Certified record* (1 vol. pleadings, 3 vols. transcripts, 5 vols. depositions), filed; and cause docketed.
Sept. 3	Appearance of W. Dougherty for appellants.
Sept. 10	Appearance of H. Sanger, C. Wagner, T. Pederson and N. Della Volpe for appellee.
Sept. 13	Appellants' designation of record for appendix (m–9/10).
Sept. 17	Order directing appellants to file their brief and joint appendix not later than September 24, 1976 and appellee file its brief not later than October 8, 1976. SS–7.
Sept. 22	Appellee's designation of record for appendix (p–9/20).
Sept. 27	Brief (25) of appellants.
Sept. 27	Appendix (10) of appellants Vols. I and II (m–9/24).
Oct. 8	Brief (25) of appellee (m–10/8).
Oct. 12	Motion of appellants for division of time at oral argument (m–10/8).
Oct. 12	Exhibits Volume (10).
Oct. 13	Reply brief (25) of appellants (m–10/11).
Oct. 14	Cause argued by W. P. Boon Dougherty and Zygmunt J. B. Plater for Appellant, by Thomas A. Pedersen for Appellee and case submitted to the Court (Before: Celebrezze, Peck and McCree, JJ.). TT–3.

Oct. 19	Motion of appellee for leave to file supplemental answers to questions asked during oral argument (m–10/19).
Oct. 19	Supplemental answers of appellee to questions asked during oral argument (m–10/19) (Tendered).
Nov. 11	Order granting motion of appellee for leave to file supplemental answers to questions asked during oral argument and directing that appellants may file a response thereto by 11/26/76 if they so desire (Celebrezze, J.). TT–6.
Nov. 19	Response of appellants to appellees' post-argument supplemental answers (m–11/18).
1977	
Jan. 31	Judgment of the District Court reversed and remanded for further proceedings.
Jan. 31	Opinion by Celebrezze, J. (McCree, J., filed a concurring opinion).
Mar. 3	Mandate issued (Costs to be recovered by Appellants—$50 filing fee).
Mar. 3	Opinion with mandate.
Apr. 27	Copy of letter from Clerk of Supreme Court advising counsel that time for filing petition for certiorari was extended to 5/31/77.
June 6	Notice of filing petition for certiorari 5/31/77 (Sup. Ct. No. 76–1701).
Oct. 25	Record for certiorari application mailed to Supreme Court.
Oct. 27	Letter of Supreme Court requesting transmittal of record to Supreme Court.
Nov. 17	Certified copy of order of Supreme Court granting certiorari 11/14/77.

In the United States District Court for the Eastern District of Tennessee, Northern Division

Civil Action No. 3–76–48

HIRAM G. HILL, Jr., ZYGMUNT J. B. PLATER AND DONALD S. COHEN, PLAINTIFFS

v.

TENNESSEE VALLEY AUTHORITY, DEFENDANT

Complaint for Injunctive Relief

1. The plaintiffs are all citizens and residents of Knox County, Tennessee. In addition, the plaintiffs use the Little Tennessee River and area for fishing, floating, boating and other recreational activities. They are individuals concerned with the conservation of irreplaceable natural resources in general and in the area of the Little Tennessee River in particular. The actions of the defendant Tennessee Valley Authority hereinafter described have infringed and will infringe upon and interfere with the rights of the plaintiffs.

2. The defendant, Tennessee Valley Authority, is a corporation organized pursuant to Legislative Act of the Congress of the United States of America, said Act being known as the "Tennessee Valley Authority Act of 1933", and being designated as 16 U.S.C. § 831 (a–dd) (1933). Said defendant's principal office is located in the immediate vicinity of Muscle Shoals, Alabama, and it also has an office in Knoxville, Knox County, Tennessee. Pursuant to 16 U.S.C. § 831 (c)(b) said defendant may sue and be sued in its corporate name.

3. This action is brought seeking the issuance of a temporary and permanent injunction by this Court to enjoin further construction and implementation of the Tellico Dam and the Tellico Project by the defendant Tennessee Valley Authority, which actions by said defendant are illegal and in violation of the Endangered Species Act (16 U.S.C. §§ 1531–1543) (1973). The purpose and effect of said injunctions will be the preservation and protection of the fish known as the Snail Darter, sci-

entifically known as *Percina (Imostoma) Tanasi*, a designated endangered species pursuant to said statute, and the preservation and protection of its habitat which has been deemed a critical habitat, pursuant to said Endangered Species Act.

4. Jurisdiction for this action is conferred upon this Court by 16 U.S.C. § 1540 (c) and (g) (1973), known also as the Endangered Species Act, which provides in pertinent parts as follows:

> 16 U.S.C. § 1540(c)
>
> (c) The several district courts of the United States * * * shall have jurisdiction over any actions arisng under this chapter.
>
> 16 U.S.C. §1540 (g) (1) and (2)
>
> (g) (1) Except as provided in pargraph (2) of this subsection any person may commence a civil suit on his own behalf—
>
> (A) to enjoin any person, including the United States and any other governmental instrumentality or agency (to the extent permitted by the eleventh amendment to the Constitution), who is alleged to be in violation of any provision of this chapter or regulation issued under the authority thereof * * *.
>
> The district courts shall have jurisdiction, without regard to the amount in controversy or the citizenship of the parties, to enforce any such provision or regulation, as the case may be * * *.
>
> (2) (A) No action may be commenced under subparagraph (1) (A) of this section—
>
> (i) prior to sixty days after written notice of the violation has been given to the Secretary, and to any alleged violator of any such provision or regulation * * *.
>
> (3)(A) Any suit under this subsection may be brought in the judicial district in which the violation occurs * * *.

5. 16 U.S.C. § 1531 (1973), provides in pertinent parts as follows:

> § 1531. *Congressional findings and declaration of purposes and policy.*
>
> The Congress finds and declares that—
>
> (1) various species of fish, wildlife, and plants in the United States have been rendered extinct as a consequence of economic growth and development untempered by adequate concern and conservation;
>
> (2) other species of fish, wildlife, and plants have been so depleted in numbers that they are in danger of or threatened with extinction;
>
> (3) these species of fish, wildlife, and plants are of esthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people;
>
> * * * * *
>
> (5) (b) The purposes of this chapter are to provide a means whereby the ecosystems upon which endangered species and threatened specics depend may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purposes of the treaties and conventions set forth in subsection (a) of this section.
>
> (c) It is further declared to be the policy of Congress that all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this chapter.

6. 16 U.S.C. § 1532 (1973), provides in pertinent parts as follows:

> § 1532. *Definitions.*
>
> * * * * *
>
> (4) The term "endangered species" means any species which is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary to constitute a pest whose protection under the provisions of this chapter would present an overwhelming and overriding risk to man.
>
> (5) The term "fish or wildlife" means any member of the animal kingdom, including without limitation any mammal, fish, bird (including any migratory, nonmigratory, or endangered bird for which protection is also afforded by treaty or other international agreement), amphibian, reptile, mollusk, crustacean, arthropod or other invertebrate, and includes any part,

product, egg, or offspring thereof, or the dead body or parts thereof.

(8) The term "person" means an individual, corporation, partnership, trust, association, or any other private entity, or any officer, employee, agent, department, or instrumentality of the Federal Government, of any State or political subdivision thereof, or of any foreign government.

* * * * *

(10) The term "Secretary" means, except as otherwise herein provided, the Secretary of the Interior or the Secretary of Commerce as program responsibilities are vested pursuant to the provisions of Reorganization Plan Numbered 4 of 1970; except that with respect to the enforcement of the provisions of this chapter and the Convention which pertain to the importation or exportation of terrestrial plants, the term means the Secretary of Agriculture.

* * * * *

(14) The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct * * *.

7. 16 U.S.C. § 1533 (1973), provides in pertinent parts as follows:

§ 1533. *Determination of endangered species and threatened species—Generally*

(a) (1) The Secretary shall by regulation determine whether any species is an endangered species or a threatened species because of any of the following factors:

(1) the present or threatened destruction, modification, or curtailment of its habitat or range * * *.

8. 16 U.S.C. § 1536 (1973), provides as follows:

§ 1536. *Interagency cooperation*

The Secretary shall review other programs administered by him and utilize such programs in furtherance of the purposes of this chapter. All other Federal departments and agencies *shall*, in consultation with and

with the assistance of the Secretary, utilize their authorities in furtherance of the purposes of this chapter by carrying out programs for the conservation of endangered species and threatened species listed pursuant to section 1533 of this title and by taking such action necessary to *insure that actions authorized, funded, or carried out by them do not jeopardize the continued existence of such endangered species and threatened species or result in the destruction or modification of habitat* of such species which is determined by the Secretary, after consultation as appropriate with the affected States, to be *critical*.

9. 16 U.S.C. § 1538 (1973), provides in pertinent parts as follows:

§ 1538. *Prohibited Acts—Generally*

(a) (1) * * * [w]ith respect to any endangered species of fish or wildlife listed pursuant to section 1533 of this title it is unlawful for any person subject to the jurisdiction of the United States to—

* * * * *

(B) take any such species within the United States or the territorial sea of the United States;

* * * * *

(G) violate any regulation pertaining to such species or to any threatened species of fish or wildlife listed pursuant to section 1533 of this title and promulgated by the Secretary pursuant to authority provided by this chapter.

10. On January 20, 1975, certain of the plantiffs petitioned the Department of the Interior to list the Snail Darter as an endangered species. On or about October 9, 1975, after extensive scientific study and analysis by several parties and review of comments, the Secretary of the Interior, pursuant to statutory authority and direction, effected a determination by published rule and regulation that the Snail Darter, *Percina (Imostoma) Tanasi*, was an endangered species and that its habitat (Little Tennessee River) was critical to its survival or destruction. Said determination further provided: "The proposed impoundment of water behind the proposed Tellico Dam would result in total destruction of the snail darter's habitat."

Said rule and regulation is specifically incorporated herein by reference in its entirety and attached hereto and made a part hereof as Exhibit A. The Little Tennessee River is the only habitat of the Snail Darter.

Further, the Department of the Interior, through its Director of the United States Fish and Wildlife Service, has formally issued a proposed rulemaking which will determine critical habitat for six (6) endangered species, included among which is the Snail Darter. Said proposed rulemaking dated November 12, 1975, and published in the Federal Register (Volume 40, No. 242, page 58308) on December 16, 1975, provides as follows at 58308 and 58310:

BASIS FOR DETERMINATION

SNAIL DARTER (*Percina* (*Imostoma*) SP.)

Tennessee. Critical habitat for the snail darter extends from river mile 0.5 to river mile 17 of the Little Tennessee River, Loudon County, Tennessee. River miles 0.5 through 17 are shown on a map entitled "Tellico Project", prepared by the Tennessee Valley Authority (TVA), Bureau of Water Control Planning, August 1965 (map 65–MS–453 K 501). River mile 17 is two river miles below the U.S. Highway 411 bridge over the Little Tennessee River, and is near Rose Island; river mile 0.5 on the Little Tennessee River is one half mile upstream from its confluence with the Tennessee River. Presently, this section of river is the only known existing habitat of the snail darter. In portions of this area, certain conditions exist which are required by the species, and the disruption of these conditions would lead to decline or extinction of the snail darter * * *.

* * * * *

SUBPART F—CRITICAL HABITAT

§ 17.81 Snail darter.

(a) The following area is critical habitat for the snail darter (*Percina* (*Imostoma*) sp.): From river mile 0.5 to river mile 17 of the Little Tennessee River, Loudon County, Tennessee, as shown on a map entitled "Tellico Project", prepared by Tennessee Valley Authority,

Bureau of Water Control Planning, August 1965 (map 65–MS–453 K 501).

(b) Pursuant to section 7 of the act, all Federal agencies must take such action as is necessary to insure that actions authorized, funded, or carried out by them do not result in the destruction or modification of this critical habitat area.

The plaintiffs aver that the actions of the defendant Tennessee Valley Authority in continuing and completing the Tellico Dam and Project will permanently destroy the Snail Darter and render it extinct and will further destroy the only habitat of the Snail Darter which is absolutely critical and vital to its continued existence. The plaintiffs further aver that the defendant Tennessee Valley Authority has been given notice of its actions and the consequences thereof, and has further been given notice of its violations of the Endangered Species Act, but nevertheless continues with its actions in open violation of the law.

Critical Habitat has been defined by the Department of Interior, through its United States Fish and Wildlife Service and the National Marine and Fisheries Service, as follows (Federal Register, Volume 40, No. 78):

"Critical habitat" for any Endangered or Threatened species could be the entire habitat or any portion thereof, if, and only if, any constituent element is necessary to the normal needs or survival of that species. The following vital needs are relevant in determining "critical habitat" for a given species:

(1) Space for normal growth, movements, or territorial behavior;

(2) Nutritional requirements, such as food, water minerals;

(3) Sites for breeding, reproduction, or rearing of offspring;

(4) Cover or shelter; or

(5) Other biological, physical, or behavioral requirements.

11. Notwithstanding such notice and the Secretary's determination that the Snail Darter is an *endangered species* and its *habitat* in the Little Tennessee River is *critical*, the defendant Tennessee Valley Authority is proceeding at full speed with utter disregard for said determination to complete the Tellico

Dam and Project, all in violation of 16 U.S.C. §§ 1531–1543 (1973). One of the more blatant and graphic demonstrations of said violation is the current extensive bull-dozing and clear-cutting of trees, logs and foliage along the banks of the Little Tennessee River by the defendant Tennessee Valley Authority in the habitat area of the Snail Darter. Such bulldozing and clear-cutting of trees, logs and foliage also jeopardizes the continued existence of the Snail Darter and effects a destruction and modification of its critical habitat, the waters, shoals and gravel substrate of the Little Tennessee River, and further erodes the public interest pending the final determination of the question on the merits.

12. On or about October 20, 1975, the plaintiffs, pursuant to 16 U.S.C. § 1540 (g)(2)(A)(i) (1973), gave the requisite notice of said violation to the Secretary of the Interior and to the violator, the defendant herein, Tennessee Valley Authority. The violation has occurred and is occurring in the judicial district of this Court.

13. In addition, the construction and implementation of the Tellico Dam and Tellico Project by the defendant Tennessee Valley Authority will not only jeopardize and destroy the Snail Darter and its critical habitat, the Little Tennessee River, all in violation of 16 U.S.C. §§ 1531–1543 (1973), but will also affect adversely and derogate the quality of human life in the Little Tennessee River area, and violates the strong purpose and intent of Congress as enunciated in the Act.

14. Accordingly, the plaintiffs seek an expedited hearing before this Court as soon as practicable and the issuance by the Court, following such hearing or hearings, of a temporary and permanent injunction to enjoin said violation and specifically enjoining the defendant Tennessee Valley Authority, its agents, servants, employees and representatives, from any further work, activity and/or construction related to the Tellico Dam or Tellico Project or the implementation thereof and requiring the immediate and permanent cessation of all work and activity in any way related to or a part of the Tellico Dam or the Tellico Project. Irreparable injury and damage will result unless this Court so acts.

WHEREFORE, PLAINTIFFS PRAY:

1. That the Court conduct an expedited hearing or hearings relative to the issues presented in this Complaint as soon as practicable.

2. That, upon such expedited hearings, the Court issue a temporary and permanent injunction as requested in said Complaint.

3. For such other relief as justice and equity may require.

W. P. Boone Dougherty,
Attorney for Plaintiffs, 1200 Hamilton National Bank Bldg., Knoxville, Tennessee 37902, Tel. No. (615) 546–8030.
Of Counsel:
Bernstein, Dougherty & Susano.

Motion

The plaintiffs move the Court for an expedited hearing relative to the issues and matters presented in the foregoing Complaint.

This 18th day of February, 1976.

W. P. Boone Dougherty,
Attorney for Plaintiffs.

In the United States District Court for the Eastern District of Tennessee, Northern Division

Civ. 3-76-48

HIRAM G. HILL, Jr., ZYGMUNT J. B. PLATER AND DONALD S. COHEN

v.

TENNESSEE VALLEY AUTHORITY

Order

It is ORDERED that defendant show cause on Wednesday, February 25, 1976 at the Federal Courthouse, Knoxville, Tennessee, at 9:00 A.M. why the temporary injunction sought in the complaint should not be granted.

Enter:

ROBERT TAYLOR,
United States District Judge.

[Caption Omitted]

Motion To Dismiss

Defendant Tennessee Valley Authority moves the Court to dismiss this action on the ground that the Court lacks jurisdiction because plaintiffs have failed to comply with the statutory notice requirements for invoking the jurisdiction of this Court under the Endangered Species Act of 1973.

Respectfully submitted,

HERBERT S. SANGER, Jr.,
General Counsel, Tennessee Valley Authority,
Knoxville, Tennessee 37902.
CHARLES A. WAGNER III,
Assistant General Counsel.
THOMAS A. PEDERSEN,
LAWRENCE L. SHEARER,
Attorneys for Defendant.

212-501 O - 78 - 2

Certificate of Service

I certify that the foregoing motion, together with brief in support of motion to dismiss and in opposition to motion for injunction, has been served on plaintiffs by hand delivering a copy thereof to the offices of W. P. Boone Dougherty, Esq., Bernstein, Dougherty & Susano, 1200 Hamilton National Bank Building, Knoxville, Tennessee 37902.

This 23rd day of February, 1976.

.....

Attorney for Defendant.

[Caption Omitted]

[Filed February 26, 1976]

Opinion as Rendered From the Bench

Arguments on each side have been informative and interesting and show careful consideration by counsel of the legal and factual questions that are involved. Counsel only agree on one thing, and that is the rules to be followed by a trial court in issuing or denying a temporary injunction.

These rules, which have been stated and discussed by respective counsel, are as follows:

1. The moving party has raised a substantial question on the merits of the lawsuit;

2. The moving party has demonstrated a probability of success on the merits;

3. The injury that will be suffered by the moving party without preliminary relief is irreparable and outweighs the resulting harm to his adversary; and

4. Judicial consideration of the public interest.

Plaintiffs seek a temporary and permanent injunction to stop the construction of the Tellico Project. This is the third time the Project has been in litigation in this Court as indicated by counsel during the argument. In the first case, the plaintiffs contested the building of the dam because of an insufficient impact statement. The Court heard extensive proof at that hearing and heard Dr. Etnier testify at length about the species of fish known as darters.

In that first case, the Court issued a temporary injunction which prohibited further work on the dam because of an inadequate impact statement.

As indicated by counsel, that case went to the Court of Appeals and was affirmed; thereafter, the TVA amended its impact statement. The amendment caused a second hearing at which time the Court heard detailed proof about that impact statement.

The Court, after extensive proof and arguments of counsel, held that the impact statement complied with the provisions of the National Environmental Protection Act. Thereupon, the plaintiffs in that case appealed to the Court of Appeals and, as also stated by counsel, that decision was likewise affirmed.

Section 1536 of the Endangered Species Act of 1973 (16 U.S.C. §§ 1531–1543) provides, in pertinent part, that all Federal agencies

> shall, in consultation with and with the assistance of the Secretary, utilize their authorities in furtherance of the purposes of this chapter by • • • taking such action necessary to insure that actions authorized, funded, or carried out by them do not jeopardize the continued existence of • • • endangered species and threatened species or result in the destruction or modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with the affected states, to be critical.

The legislative history of this section states that

> [a]ll agencies, departments and other instrumentalities of the Federal government are directed to cooperate in the implementation of the goals of this Act. (S. Rep. No. 93–307, 93rd Cong., 1st Sess., 2 U.S. Code Cong. & Admin. News, p. 2997.)

On October 9, 1975, the Secretary of the Interior determined that the snail darter was an endangered species, that its habitat, the Little Tennessee River, was critical to its survival or destruction, and noted that "[t]he proposed impoundment of water behind the proposed Tellico Dam would result in total destruction of the Snail Darter's habitat." Exhibit A to the Complaint. In reaching this conclusion the Secretary of the Interior considered the objections of T.V.A. to listing the snail darter on the Endangered Species List. Some of the objections raised and apparently rejected by the Secretary are as follows:

1. The snail darter is not a new and distinct species;
2. No present threat to the snail darter exists since there is scientific opinion that it exists in other parts of the Tennessee River System;
3. TVA and others are undertaking a scientifically recognized program to conserve the snail darter;

4. The Fish and Wildlife Service of the Department of Interior should not inject itself into "the longstanding controversy surrounding the wisdom of the Tellico Project." The federal courts have already passed on the sufficiency of TVA's impact statement which considered undescribed species of darters;
5. Impoundment of the lake is set for January 1977;
6. Congress continues to fund the project; and
7. There "is no scientific basis to support listing the snail darter, there is no environmental need for such action, and that nothing positive would be accomplished."

In spite of the objections made by TVA, the Secretary placed the snail darter on the Endangered Species List.

The only case found by this Court which deals with an entity of the federal government as a defendant was *Sierra Club* v. *Froehlke*, 392 F. Supp. 130 (E.D. Mo. 1975). In that case, the plaintiff alleged that the construction of a certain dam by the Army Corps of Engineers would modify or destroy the habitat of the Indiana Bat. The District Judge held, among other things, that the Corps of Engineers' activities had not resulted in harassing or endangering the Indiana Bat. The Court also found that when the lake was impounded, no caves presently inhabited by the bats would be affected, even if the lake were not impounded, the Indiana Bat faced extinction within fifteen or twenty years. 392 F. Supp. at 144. The trial judge declined to interfere with the construction of the dam and found as a fact that the "Corps of Engineers has been, and is, making all possible reasonable good faith efforts to comply with the provisions of the Endangered Species Act of 1973." 392 F. Supp. at 138. That decision is now pending in the Court of Appeals for the Eighth Circuit. Counsel for plaintiffs also mentioned the case of *United States* v. *Cappaert*, 508 F.2d 313 (9th Cir. 1974). We have examined that case and are of the opinion that the case dealt more with the enforcement of the Government's right to certain ground water than it dealt with enforcement of the Endangered Species Act. Counsel also mentioned an unreported case arising in the Southern District of Mississippi, but the Court has not had an opportunity to examine the opinion.

In the present case, one of the issues is whether the TVA has taken "such action necessary to insure that" the impoundment

of Tellico Lake does not "jeopardize the continued existence of" the snail darter "or result in the destruction or modification of habitat of such species which is determined by the Secretary • • • to be critical." 16 U.S.C. § 1536.

The Secretary, as previously indicated, has determined that impoundment of the Tellico Lake would totally destroy the snail darter's habitat. Thus, the Secretary's position is seemingly that if the Tellico Project is prosecuted to completion the snail darter will be rendered extinct.

Plaintiffs allege that TVA is attempting to "take" the snail darter in violation of Title 16 § 1538(a)(1) (B) and (G), and that such violation may be enjoined pursuant to 16 U.S.C. § 1540(g)(1)(A).

The plaintiffs' arguments in support of the motion for a temporary injunction may be summarized as follows:

> (1) That plaintiffs will be irreparably harmed if the snail darter is rendered extinct by the actions of TVA in bulldozing and clear-cutting trees which may destroy the critical habitat of the darter before the case can be heard on the merits; and
>
> (2) the public interest requires preservation of this endangered species.

The arguments in opposition to the motion are set forth in definitive form in the brief of the TVA. The first point TVA makes in that connection is that the Court does not have jurisdiction of the case because proper notice was not given to it or to the Secretary of the Interior in accordance with the provisions of the Act. *See* 16 U.S.C. § 1540(g)(2)(A)(i).

The Secretary of the Interior and TVA received notice more than 60 days before the suit was filed. TVA's argument is highly technical and, in the opinion of the Court, it is lacking in merit. If such a defense were plausible this Court would hesitate to base a decision on such a procedural technicality rather than on the merits of the case.

The second argument made by TVA is that the Endangered Species Act does not apply to the Tellico Project. It is assumed that TVA intends to convey the idea that the Act is not retroactive and that the Congress did not intend for it to apply to projects begun before the Act was passed.

The Tellico Project was started or discussed as early as 1967 and, with the exception of the interruptions caused by the courts, has continued toward completion since that time.

In the opinion of the Court, the Endangered Species Act does apply to the Tellico Project; but whether or not Congress intended the Endangered Species Act to permit the halting of the Tellico Project after approximately $80-million has been spent on it is another question, a question that will not be decided by the Court at this time.

The Court will give the parties an opportunity, if they desire, to present proof on the merits of the case at which time further discussion of this point as well as several other points in the brief will be heard.

In this connection, if the parties take advantage of a hearing on the merits, the Court expects them to stipulate as many facts as possible and to formulate with clarity the disputed questions of fact, if any. At this point, it appears to the Court that the decision on the merits will turn on questions of law rather than on questions of fact.

The Court cannot say at this time that plaintiffs have demonstrated a probability of success on the merits. The Court is of the opinion that this is highly doubtful. Nor can the Court find at this time that the injury which plaintiffs will suffer unless a preliminary injunction is granted outweighs the harm that would result to TVA.

During the argument the Court was advised by counsel that the prior injunction issued by this Court cost the TVA approximately $15 million, an amount which was shocking to the Court. As indicated, the Court cannot find at this time that the injury to plaintiffs would outweigh the harm to TVA if a temporary injunction were to be issued.

Of course, the public interest is involved in this case. The plaintiffs are interested in preserving the environment. The TVA says that it is likewise interested in the environment, but says the harm that would be done by the issuance of an injunction would greatly outweigh the good that it would do plaintiffs and other citizens of the United States.

The Court is of the opinion and finds that the issuance of a temporary injunction cannot be justified on the present record.

Accordingly, plaintiffs' motion is denied.

Order accordingly.

ROBERT TAYLOR,
United States District Judge.

[Caption Omitted]

[Filed February 26, 1976]

ORDER

For the reasons stated in an Opinion As Rendered From The Bench and this day passed to the Clerk of the Court, it is ORDERED that plaintiffs' motion for a preliminary injunction be, and the same hereby is, denied and that TVA's motion to dismiss at this time be, and the same hereby is, likewise denied.

Enter:

Robert Taylor,
United States District Judge.

[Caption Omitted]

[Filed April 12, 1976]

Order Pursuant to Pretrial

It is agreed by the attorneys for the parties and ordered by the court that this order will be binding on the parties at the trial on the merits.

NATURE OF ACTION

This is an action for injunctive relief pursuant to the Endangered Species Act (16 U.S.C. §§ 1531–1543) (1973) whereby the plaintiffs are seeking to enjoin further construction and implementation of the Tellico Dam and Tellico Project by the defendant, Tennessee Valley Authority, and, more immediately, the current extensive bulldozing and clear-cutting of trees, logs and foliage along the banks of the Little Tennessee River by the defendant, Tennessee Valley Authority, so that the Snail Darter, scientifically known as *Percina* (*Imostoma*) *tanasi*, a designated endangered species pursuant to said Act, and the habitat of the Snail Darter in the Little Tennessee River will not be destroyed. Jurisdiction of this action is predicated upon 16 U.S.C. §§ 1540 (c), 1540 (g) (1), (2) and (3).

THEORIES UPON WHICH PLAINTIFFS EXPECT TO RECOVER

On August 12, 1973, Dr. David A. Etnier, Assistant Professor, Department of Zoology, University of Tennessee, and an ichthyologist, discovered a new and distinct species of fish designated and known as the Snail Darter in the Little Tennessee River. On November 10, 1975, the Secretary of Interior, pursuant to the Endangered Species Act, designated the Snail Darter as an endangered species and determined that: "the proposed impoundment of water behind the proposed Tellico Dam would result in total destruction of the snail darter's habitat". The Little Tennessee River area is a critical habitat for the snail darter. The further construction and implementation of the Tellico Dam and Tellico Project by the defendant

Tennessee Valley Authority will result in the total destruction of the snail darter and the snail darters habitat. Further, the further construction and implementation of the Tellico Dam and Tellico Project by the defendant is illegal and constitutes violation of the Endangered Species Act. Such violations by the defendant clearly justifies this Court in the issuance of an injunction enjoining further construction and implementation of the Tellico Dam and Tellico Project and the bulldozing and clear-cutting above-referred to. Irreparable injury and damage will result unless the Court issues the requested injunctive relief. Of the sum of approximately $72 million dollars which has been spent by TVA on all phases of the Tellico Project, the sum of only $14,818,000.00 has been expended on the construction of the Tellico Dam. This project is severable in that if the Court enjoins further construction of the Tellico Dam, the defendant Tennessee Valley Authority could put the rest of their investment to constructive use and benefit for the area.

THEORIES UPON WHICH DEFENDANT EXPECTS TO DEFEAT RECOVERY

TVA agrees, for purposes of this lawsuit only, and subject to the results of scientific studies now in progress, that the following statements are true and may be considered as a part of the evidence in this cause:

1. That on August 12, 1973, Dr. David A. Etnier discovered the snail darter, a small, tan-colored fish about three inches long, at Coytee Springs on the Little Tennessee River at river mile 7. As of 1970, there were 109 described species of darters, 63 of which existed in the State of Tennessee, and 43 in the Tennessee River system.

2. That the snail darter is a "species" within the meaning of the Endangered Species Act of 1973, and was listed as an endangered species under that Act, effective November 10, 1975 (40 Fed. Reg. 47505–506 (Oct. 9, 1975)).

3. That the snail darter's only known habitat is that portion of the Little Tennessee River lying between river mile 17 and river mile 0.5 (Tellico Dam site), and that portion of the river lying below the Tellico Dam site which constitutes the upper reaches of the Watts Bar Reservoir in and near the mouth of the Little Tennessee River.

4. That all of that portion of the snail darter's known habitat which lies within the confines of the Little Tennessee River between river mile 0.5 and river mile 17 will be altered or modified by the impoundment of water behind Tellico Dam.

5. On December 16, 1975, the Fish and Wildlife Service published a proposed rule in the *Federal Register*, seeking comments on the designation of Little Tennessee River miles 0.5 to 17 as the critical habitat for the snail darter. As yet, there has been no final determination of critical habitat.

6. Construction of the dam began March 7, 1967, and is scheduled for completion in January 1977.

7. In its present state, the streamflow in the lower Little Tennessee River is partially controlled by a series of 20 upstream dams which cause the water to be cleaner and colder than it was before the dams were built. Today the sediment load is 254,000 tons per year. Prior to the dams, the silt load was about 800,000 tons per year; and prior to colonial times, in its natural pristine state, the silt load was about 250,000 tons per year.

8. Today approximately $80 million has been invested, and the project is nearly 80 percent completed.

9. In connection with its budget request for fiscal 1977, TVA has informed the President, through the Office of Management and Budget, about the listing of the snail darter, the opposition to the project, TVA's conservation efforts, and TVA's determination to complete the project while doing its best to preserve the darter.

10. On January 21, 1976, the President submitted to Congress a budget request of $9.7 million for fiscal 1977 to complete the Tellico project.

11. Any other matter of which the Court will take judicial knowledge.

1. Plaintiffs have the burden of proving throughout:

(a) That TVA has violated the Endangered Species Act of 1973.

(b) That an injunction should issue.

(c) That the Act mandates an injunction.

(d) That an injunction would not be contrary to the public interest.

2. The Act is not applicable to the Tellico project.

3. If applicable, TVA has not violated the Act:
(a) The Act must be construed in a reasonable manner.
(b) TVA has taken reasonable action to preserve the darter while completing the project.
(c) Congress has ratified TVA's interpretation.
(d) OMB, being informed, has requested appropriations (speaks for President and all agencies).
4. The Act does not mandate an injunction.
(a) The court has power to grant or deny.
(b) Nowhere does the Act say that the court must grant an injunction.
5. An injunction would be contrary to the public interest:
(a) Congress speaks for the public.
(b) OMB also speaks for the public.
6. TVA's actions have not been arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with laws.

ISSUES

(1) Will the further implementation of the Tellico Project and the completion of the Tellico Dam and water impoundment result in the total destruction of the Snail Darter and the Snail Darter's habitat?

(2) Whether a violation of the Endangered Species Act by the defendant TVA should result in the issuance of the requested injunctive relief when that situation is weighed in relation to the Tellico Dam and Tellico Project?

(3) Is the Endangered Species Act applicable to the Tellico Project and the Tellico Dam?

(4) If applicable, does the Endangered Species Act prevent the completion of the Tellico Project and Dam?

(5) What effects, if any, should be given to Presidential Action requesting appropriations and Congressional action appropriating funds to complete the Tellico Project after being informed of its effect on the Snail Darter?

(6) Was TVA's decision to proceed with construction of the project arbitrary, capricious or otherwise not in accordance with law?

Parties shall exchange the names and addresses of witnesses in writing on or before April 19, 1976, and mark exhibits two days prior to trial date.

Parties shall submit trial briefs and proposed findings of fact and conclusions of law at least ten days before trial.

Parties shall have ten days from and after April 12, 1976, within which to except to any part of this order.

Approved for filing and docketing:

ROBERT TAYLOR,
United States District Judge.

[Caption Omitted]

Exceptions to Pretrial Order on Behalf of Plaintiffs

The plaintiffs present the following exceptions to the Pretrial Order filed in this cause on April 12, 1976:

1. Under the section styled *NATURE OF ACTION*, the plaintiffs contend that same should be modified and altered to read as follows:

> This is an action for injunctive relief pursuant to the Endangered Species Act (16 U.S.C. §§ 1531–1543) (1973), whereby the plaintiffs are seeking to enjoin further construction and implementation of the Tellico Dam and Tellico reservoir by the defendant, Tennessee Valley Authority, and, more immediately, the current extensive bull-dozing and clear-cutting of trees, logs and foliage along the banks of the Little Tennessee River by the defendant, Tennessee Valley Authority, so that the Snail Darter, scientifically known as Percina species pursuant to said Act, will not be jeopardized and the critical habitat of the Snail Darter in the Little Tennessee River will not be destroyed or modified. Jurisdiction of this action is predicated upon 16 U.S.C. §§ 1540 (c), 1540 (g) (1), (2) and (3).

2. The section styled *THEORIES UPON WHICH PLAINTIFFS EXPECT TO RECOVER* should be modified and altered so that same will read as follows:

> On August 12, 1973, Dr. David A. Etnier, Assistant Professor, Department of Zoology, University of Tennessee, and an ichthyologist, discovered a new and distinct species of fish designated and known as the Snail Darter in the Little Tennessee River. On November 10, 1975, the Secretary of Interior, pursuant to the Endangered species Act, designated the Snail Darter as an endangered species and determined that: "The proposed impoundment of water behind the proposed Tellico Dam would result in total destruction of the Snail

Darter's habitat." Further, on April 1, 1976, the Department of Interior further determined that the Little Tennessee River between river mile .5 and river mile 17 was critical habitat for the Snail Darter. The further construction and implementation of the Tellico Dam and Tellico reservoir by the defendant, Tennessee Valley Authority, will jeopardize the existence of the Snail Darter and will destroy and modify the critical habitat of the Snail Darter in the Little Tennessee River. Further, the further construction and implementation of the Tellico Dam and Tellico reservoir by the defendant, Tennessee Valley Authority, is illegal and constitutes violation of the Endangered Species Act. Such violations by the defendant clearly justifies this Court in the issuance of an injunction enjoining further construction and implemetation of the Tellico Dam and Tellico reservoir and the bull-dozing and clear-cutting above referred to. Irreparable injury and damage will result unless the Court issues the requested injunctive relief. The plaintiffs contend that it is not appropriate for the Court to consider in this cause any evidence by the defendant, TVA, concerning the costs and expenditures involved in the Tellico Project nor the percentage of completion of same and submit that, if such is in any way considered by the Court, it will open completely costs and detriments of the Tellico Project and would entitle the plaintiffs to introduce evidence concerning the costs, benefits, values, and detriments concerning said Tellico Project.

3. Under the section styled *THEORIES UPON WHICH DEFENDANT EXPECTS TO DEFEAT RECOVERY*, the court reporter has listed as the first eleven paragraphs under same those matters which the defendant was willing to stipulate in this cause. The parties are conferring concerning stipulations and will prepare and present to the Court certain stipulations to assist the Court in the trial of this cause. However, it is clearly inappropriate for such proposed stipulations to be a part of the Pretrial order and, accordingly, the first eleven (11) paragraphs of the theories of the defendant should be deleted from the Pretrial Order.

Following paragraph 11 in the Theories of the Defendant the court reporter has correctly listed the six proposed Theories of the Defendant. It is appropriate that such remain in the Pretrial Order.

4. Under the section styled *ISSUES*, the plaintiffs contend that the first two issues under said section should be modified so that same read as follows:

> 1. Whether the closure of the Tellico Dam and the consequent creation of the Tellico reservoir will jeopardize the existence of an endangered species, the Snail Darter, or destroy or modify the critical habitat of such endangered species?
>
> 2. If so, will such violation of the Endangered Species Act require the Court to issue an injunction to enforce the Endangered Species Act?

The plaintiffs submit that it is appropriate for the Court to consider the existing numbered Issues 3, 4, 5, and 6 under the present section ISSUES.

The plaintiffs respectfully request that the Court and the court reporter modify the Pretrial Order filed in this cause on April 12, 1976, as above presented.

Respectfully submitted,

W. P. BOONE DOUGHERTY,
Attorney for Plaintiffs.

Of Counsel:
W. P. BOONE DOUGHERTY,
Bernstein, Dougherty & Susano,
1200 Hamilton National Bank Bldg.,
Knoxville, Tennessee 37902

[Caption Omitted]

TVA's Opposition to Plaintiffs' Exceptions to Pretrial Order

In response and opposition to plaintiffs' exceptions to the pretrial order of April 12, 1976, defendant Tennessee Valley Authority (TVA) states as follows:

1. TVA opposes plaintiffs' proposed deletion of the first eleven paragraphs listed under THEORIES UPON WHICH DEFENDANT EXPECTS TO DEFEAT RECOVERY. The factual matters contained therein, to which defendant was willing to stipulate, are all relevant to this action and constitute an integral part of the theories upon which defendant expects to defeat recovery.

2. TVA opposes plaintiffs' proposed modification of the second issue (under the section styled ISSUES) on the ground that said modification incorrectly presupposes that the activity under Issue 1 constitutes a violation of the Endangered Species Act. TVA would offer no objection to a modification of the second issue to read as follows:

> 2. If so, does such activity constitute a violation of the Endangered Species Act and, under the circumstances of this case, require the Court to issue an injunction?

Respectfully submitted,

HERBERT S. SANGER, Jr.,
General Counsel,
Tennessee Valley Authority,
Knoxville, Tennessee.
CHARLES A. WAGNER III,
Assistant General Counsel.
THOMAS A. PEDERSEN,
NICHOLAS A. DELLA VOLPE,
Attorneys for Defendant.

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Certificate of Service

I certify that the foregoing document has been served on plaintiffs by hand delivering a copy thereof to the offices of W. P. Boone Dougherty, Esq., Bernstein, Dougherty & Susano, 1200 Hamilton National Bank Building, Knoxville, Tennessee 37902.

This 23rd day of April, 1976.

CHARLES A. WAGNER III,
Attorney for Defendant.

[Caption Omitted]

[Filed April 23, 1976]

It is ORDERED that the pretrial order be modified and altered in the manner set forth in plaintiffs' exceptions in regard to paragraphs 1 and 2 thereof.

It is FURTHER ORDERED that the exception of plaintiffs to the pretrial order relating to alleged stipulations that were not agreed to by plaintiffs, but were agreed to by T.V.A. be, and the same hereby is, denied, as plaintiffs have no right to complain of matters to which T.V.A. is willing to agree.

The pretrial order is amended so as to add to Issue No. 1 the following:

> Whether the closure of the Tellico Dam and the consequent creation of the Tellico reservoir will jeopardize the existence of an endangered species, the Snail Darter, or destroy or modify the critical habitat of such endangered species?

and add to Issue No. 2 the following:

> Or whether a violation of the Endangered Species Act requires the Court to issue an injunction to enforce the Endangered Species Act?

ROBERT TAYLOR,
United States District Judge.

[Caption Omitted]

Order Amending Pre-Trial Order

Pursuant to Motion of the plaintiffs, and with the approval of counsel for the defendant, and the approval of the Court, it is hereby ORDERED by the Court that the Pre-Trial Order in this cause be modified so as to add thereto the names of two additional plaintiffs in this cause: The Association of Southeastern Biologists and Audubon Council of Tennessee, Inc., as Council for National Audubon Societies in Tennessee.

ENTER this 28th day of April, 1976.

ROBERT TAYLOR,
U.S. District Judge.

Approved for entry:

BERNSTEIN, DOUGHERTY & SUSANO
By: W. P. BOONE DOUGHERTY

Tennessee Valley Authority
By: HERBERT F. SANGER, JR.
General Counsel.

[Caption Omitted]

[Filed May 25, 1976]

Memorandum

Plaintiffs, The Association of Southeastern Biologists, the Audubon Council of Tennessee, Inc., Hiram G. Hill, Jr., Zygmunt J. B. Plater and Donald S. Cohen, seek to enjoin the completion of the Tellico Dam and consequent impoundment of the Little Tennessee River. Plaintiffs allege that defendant Tennessee Valley Authority [TVA], a wholly-owned corporation of the United States, is acting in violation of the Endangered Species Act of 1973, 16 U.S.C. § 1531 *et seq.*, by bulldozing and clear-cutting trees and foilage along the banks of the Little Tennessee River and by proceeding with plans to impound the river in January 1977.

Specifically, plaintiffs contend that TVA has violated § 7 of the Act (16 U.S.C. § 1536), which provides as follows:

"INTERAGENCY COOPERATION

"The Secretary [of the Interior] shall review other programs administered by him and utilize such programs in furtherance of the purposes of this chapter. All other Federal departments and agencies shall, in consultation with and with the assistance of the Secretary, utilize their authorities in furtherance of the purposes of this chapter by carrying out programs for the conservation of endangered species and threatened species listed pursuant to section 1533 of this title and by taking such action necessary to insure that actions authorized, funded, or carried out by them do not jeopardize the continued existence of such endangered species and threatened species or result in the destruction or modification of habitat of such species which is determined by the Sec-

retary, after consultation as appropriate with the affected States, to be critical."

Additionally, plaintiffs allege that TVA is acting in violation of § 9 of the Act (16 U.S.C. § 1538) which provides, in pertinent part, as follows:

"PROHIBITED ACTS—GENERALLY

"(a)(1) Except as provided in sections 1535(g)(2) and 1539 of this title, with respect to any endangered species of fish or wildlife listed pursuant to section 1533 of this title it is unlawful for any person subject to the jurisdiction of the United States to—

• • • • •

"(B) take any such species within the United States or the territorial sea of the United States;"

Section 1532(14) states as follows:

(14) the term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.

See also § 1532(8).

On February 25, 1976, the Court denied defendant's motion to dismiss the complaint and denied plaintiffs' motion for a preliminary injunction prohibiting further work on the Tellico Project. Trial on the merits was held April 29 and 30 and at the conclusion of the evidence and arguments of counsel, both sides were given ten days to submit post-trial briefs.

Although six issues are set forth in the pre-trial order, the controlling ones in our judgment are as follows:

(1) Whether closure of the Tellico Dam and consequent creation of the Tellico reservoir will jeopardize the continued existence of the snail darter or destroy or modify the critical habitat thereof; and

(2) Whether the Endangered Species Act of 1973 requires that an injunction issue preventing completion of the Tellico Project.

For the reasons hereafter stated, we have concluded that the answer to the first issue is in the affirmative [1] and the answer to the other one is in the negative.[2]

This controversy centers around a small, tannish-colored fish which is commonly known as the snail darter. Its name derives from the fact that it feeds primarily on small snails along the river bottom. It was discovered on August 12, 1973 by Dr. David A. Etnier, an ichthyologist and assistant professor of zoology at the University of Tennessee. Dr. Etnier discovered this new and distinct species at or near a place called Coytee Springs at approximately river mile 7 of the Little Tennessee River.[3] The snail darter, a member of the perch family, was scientifically described as *Percina (Imostoma) tanasi* by Dr. Etnier in the *Proceedings of the Biological Society of Washington*, Vol. 88, No. 44, pp. 469–488 (January 22, 1976).

On January 20, 1975 several persons, including plaintiffs Hill and Plater, petitioned the Secretary of the Department of Interior to list the snail darter as an endangered species pursuant to § 1533 of the Act. Thereafter, the Secretary invited interested persons, including TVA, to comment on a proposed rule-making to that effect. Although TVA and others objected to the proposal, the snail darter was placed on the endangered species list, effective November 10, 1975, on the ground that there was a present or threatened destruction of the snail darter or its habitat. *See* 16 U.S.C. § 1533(a)(1)(1); 50 C.F.R. § 17.11(i) (1975); 40 Fed. Reg. 47505–47506 (1975). In listing the snail darter as an endangered species, the Director of the

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[1] In light of this conclusion, we do not deem it necessary to decide whether defendant's activities constitute an illegal "taking" of the species in violation of § 9 of the Act. *See* 16 U.S.C. § 1538(a)(1)(B); *Sierra Club* v. *Froehlke*, —— F. 2d ——, No. 75-1255 (8th Cir., filed April 23, 1973), Slip Opinion at 33–34.

[2] Since this case involves novel questions of law, about which there may be differences of opinion, fairly detailed factual findings have been made despite the conclusion that the Act should not be construed as preventing completion of the project.

[3] Exhibit 2 is a map of the Tellico Project. All references to specific river miles are taken from it.

Fish and Wildlife Service of the Department of the Interior noted that

> In [the area between river miles .4 and 17 of the Little Tennessee River] the snail darter occurs only in the swifter portions of shoals over clean gravel substrate in cool, low-turbidity water. Food of the snail darter is almost exclusively snails which require a clean gravel substrate for their survival. The proposed impoundment of water behind the proposed Tellico Dam would result in total destruction of the snail darter's habitat.
>
> (40 Fed. Reg. at 47506)

On or about October 20, 1975 plaintiffs notified the Department of Interior and TVA that further implementation of the Tellico Project would violate § 7 of the Act. This lawsuit was filed February 18, 1976.

On April, 1976, the United States Fish and Wildlife Service of the Department of the Interior designated river miles .5 to 17 as "critical habitat" for the snail darter, effective May 3, 1976. 41 Fed. Reg. 13926–13928 (1976). *See* 50 C.F.R. § 17.81 (1976).[4]

The evidence introduced at trial showed that the snail darter requires for its survival a clear, gravel substrate, in a large-to-medium, flowing river. The snail darter has a fairly high requirement for oxygen and since it tends to exist in the bottom of the river, the flowing water provides the necessary oxygen at greater depths. Reservoirs, unlike flowing rivers, tend to have a low oxygen content at greater depths.

Reservoirs also tend to have more silt on the bottom than flowing rivers, and this factor, combined with the lower oxygen content would make it highly probable that snail darter eggs would smother in such an environment. Furthermore, the adult snail darters would probably find this type of reservoir environment unsuitable for spawning.

Another factor that would tend to make a reservoir habitat unsuitable for snail darters is that their primary source of food, snails, probably would not survive in such an environment.

[4] On April 22, 1975, the Department of Interior published its interpretation of "critical habitat" as it relates to § 7 of the Endangered Species Act. 40 Fed. Reg. 17764–17765. This interpretation states, *inter alia*, that critical habitat "could be the entire habitat or any portion thereof, if, and only if, any constituent element is necessary to the normal needs or survival of that species."

Although TVA introduced evidence that about a dozen snail darters have been found outside of the critical habitat area and 50 or 60 of the species have been sighted at river miles .2 to .3, this does not alter the fact that river miles .5 to 17 of the Little Tennessee River constitutes a significant portion of the snail darter's range and is a critical habitat for the species.

It was undisputed at trial that the best estimates of the snail darter population are 10,000 to 15,000 and that this population is presently in the critical habitat area. All of the portion of the Little Tennessee River which is presently designated as critical habitat area will be inundated by the waters of the Tellico Reservoir, and the water depth at Coytee Springs, the place of the snail darter's discovery, will increase from its present depth of two or three feet to a depth of thirty or forty feet.

Although the snail darter may continue to exist for several years after the proposed impoundment, it is highly doubtful that it would reproduce in a reservoir environment. We conclude, therefore, that the preponderance of the evidence demonstrates that closure of the Tellico Dam in January 1977 and the consequent creation of the Tellico Reservoir will result in the adverse modification, if not complete destruction, of the snail darter's critical habitat.[5]

As part of the program to conserve the small darter, TVA has transplanted over 700 of the species to the Hiwassee River, which provides a habitat similar to that of the Little Tennessee. The evidence showed, however, that the transplant may or may not be successful since there is no conclusive proof that the 700 snail darters will reproduce in their new environment. Chances of reprdouction in the new environment are slight according to Dr. Etnier.

As stated previously, TVA scientists have sighted 50 or 60 of the snail darters just downstream of the concrete portion of

[5] TVA concedes that a significant portion of the snail darter's presently known habitat will be altered or modified by the impoundment, but it denies that impoundment will result in total destruction of the snail darter. TVA's Trial Brief at 2. The Secretary of the Department of the Interior has indicated that a federal action affecting critical habitat would not comply with § 7 of the Act. "If such an action might be expected to result in a reduction in the number or distribution of [the] species of sufficient magnitude to place the species in further jeopardy, or restrict the potential and reasonable expansion or recovery of that species.

(40 Fed. Reg. 17764–17765 (April 22, 1975))

the dam at river miles .2 to .3. Also, 8 or 10 of the species have been sighted downstream from the mouth of the Little Tennessee River in Watts Bar Reservoir, including sightings at 4 and 10 miles downstream.

A TVA diver made what he termed a positive identification of two snail darters in the Crickamauga Reservoir below Watts Bar Dam and at a point some 85 river miles downstream from the mouth of the Little Tennessee. No specimens have been collected from the Chickamauga Reservoir, however, and the visibility conditions were poor when the sighting was made.*

TVA has searched unsuccessfully in 60 or 70 other watercourses in Alabama and Tennessee looking for other populations of snail darters. It has also unsuccessfully searched the upper reaches of the Little Tennessee River (river miles 18 to 33) in search of the darter.

In light of the fact that so few of the species have been found in places other than the critical habitat area, we conclude that it is highly probable that closure of the Tellico Dam and the consequent impoundment of the river behind it will jeopardize the continued existence of the snail darter. Almost all of the known population of snail darters will be significantly reduced if not completely extirpated, either due to the impoundment itself or the snail darter's potential loss of reproductive ability if it is unable to adapt to a new environment.

In a letter dated April 27, 1976 from Assistant Secretary Reed of the Department of the Interior addressed to Professor Plater, the following was stated:

> If such an action might be expected to result in a reduction in the number or distribution of [the] species of suffiuient magnitude to place the species in further jeopardy, or restrict the potential and reasonable expansion or recovery of that species.
>
> (40 Fed. Reg. 17764–17765 (April 22, 1975)

"Recent assertions that the snail darter exists elsewhere than in that portion of the Little Tennessee River declared to be critical habitat do nothing to change the

*The diver testified that he was at a depth of about 15' when the sighting occurred and visibility was 3' to 4'. He further testified that the total time elapsed during the sighting was about 15 seconds. Although the diver was not a trained ichythylogist, he was familiar with the snail darter's appearance.

> [Fish and Wildlife] Service's position. The biological evidence remains that if the Little Tennessee River is impounded by Tellico Dam, the continued existence of the snail darter will be jeopardized and its critical habitat destroyed.
>
> (Exhibit 33, p. 3)

The evidence shows that TVA has made a good faith effort to conserve the snail darter while carrying out its plans to complete the project. In December 1973, Dr. Etnier submitted a research proposal to TVA, requesting that it fund a biological study of the snail darter, including its life history and habitat. Dr. Etnier suggested that it might be possible to transplant the snail darter to other suitable river habitats, including the Hiwassee which he described as "the site most similar to the Little Tennessee River • • •" TVA concluded that such a program would be worthwhile, and contracted to fund a study by the University of Tennessee. Mr. Wayne Starnes, a graduate research assistant, undertook the study, which is still in the process of completion.

TVA undertook its own program in June 1975 to scientifically study the snail darter, attempt transplantation and search for new populations. TVA employs its own biologists in this study and has enlisted the assistance of outside consultants. The record shows that TVA has communicated frequently with the Fish and Wildlife Service and the State Wildlife Resources Agency about the snail darter. Several meetings have also been held with these agencies on the subject of the snail darter and its conservation.

Plaintiffs contend that TVA has not properly "consult[ed]" with the Department of Interior within the meaning of that term as used in § 7 of the Act. It is asserted that TVA has never seriously considered alternatives to completing the dam and impounding the river. Assuming this to be true, it is understandable why TVA might take such a course of action. Completion of the dam and impoundment of the river are integral parts of a project begun almost a decade ago. TVA has been moving toward this goal since ground was first broken. When the snail darter was listed on the endangered species list in November 1975, TVA was fairly close to completion of the project which has been consistently funded by Congress since 1966.

The nature of the project is such that there are no alternatives to impoundment of the reservoir, short of scrapping the entire project. Modifications or alterations to the project cannot be made at this time which will insure compliance with the Endangered Species Act. Requiring TVA to consult with other agencies about alternatives not reasonably available to it would be to require TVA to perform a useless gesture.

TVA has continued work on the project under the supervision and direction of Congress. During congressional appropriation hearings involving the project, held in April and May 1975, TVA informed both the House and Senate committees that the snail darter had been discovered; that TVA did not construe the Endangered Species Act as preventing the completion of the project; that TVA believed the environmental consequences of the project had been fully disclosed; [7] and that TVA was attempting to preserve the darter but that the project should be completed in any event. *Hearings before a Subcomm. of the House Comm. on Appropriations*, 94th Cong., 1st Sess., Pt. 7, at 467 (1976); *Senate Hearings Before the Comm. on Appropriations*, 94th Cong., 1st Sess., Pt. 4 at 3775–77 (1975).

After being so advised through its committees, Congress appropriated over $29 million for the project through September 1976. The appropriation bill was signed into law by the President on December 27, 1975—more than a month after the snail darter was placed on the endangered species list.

In recommending the appropriation, the House Committee on Appropriations stated as follows:

> The Committee directs that the project, for which an environmental impact statement has been completed and provided the Committee, should be completed as promptly as possible for energy supply and flood protection in the public interest.
>
> (H.R. Rep. No. 94–319, 94th Cong., 1st Sess. 76 (1975))

During the latest congressional appropriation hearings in March of 1976, the Chairman of the House Committee asked

[7] Although the final environmental impact statement did not mention the snail darter by name, it did discuss rare and endangered species of fish that would be affected by the project. Eleven species of darters were listed and it was noted that new species of the darter continued to be discovered in Tennessee at about the rate of one per year. Exhibit 114–B, pp. II–12–2, 3; Exhibit 114–A, p. I–3–63.

TVA Chairman Wagner to comment on the litigation pending in connection with the snail darter. He stated, in part, as follows:

> We informed both committees last year that TVA did not construe the Endangered Species Act as preventing completion of the Tellico Project; that we believed the environmental consequences of the Tellico Project had been fully disclosed; and that TVA was doing and would do its best to preserve the darter; but, in any event, that the project should be completed on schedule . . .
>
> It is TVA's position that the ultimate decision to proceed with this project rests with TVA, and that TVA has acted responsibly, and in good faith in reaching its decision to complete the project. We believe that Congress did not intend the Endangered Species Act to be retroactively applied to existing projects like Tellico, which was over 50 percent complete at the time of the act's passage and the fish's discovery, and which was 70 to 80 percent complete at the time of the official listing of the snail darter as an endangered species. Even if applicable to Tellico, TVA construes section 7 of the Endangered Species Act to require Federal agencies to take reasonable measures, in consultation with the Secretary of the Interior, to conserve endangered or threatened species of fish, wildlife, and plants. The act was not intended to supplant an agency's primary responsibilities, or to repeal prior congressional approval and funding of authorized projects, such as Tellico, because the habitat of an endangered species would be altered or destroyed by completion of the project. TVA certainly does not construe the act as a mandate to halt an authorized project without regard to its stage of completion or the fact that $80 million in public funds has been appropriated by Congress and invested in a regional development project to provide flood control, navigation, hydroelectric power, water supply, and to produce other benefits, including recreation, fish and wildlife use, shoreline development, new job opportunities, industrial development, and to foster improved economic condition in an area characterized by under-

> utilization of human resources and outmigration of young people.

The entire statement is found in *Hearings Before a Subcomm. of the House Comm. on Appropriations*, 94th Cong., 2d Sess., pt. 5, at 260–62 (1976). The identical statement was given to both the Senate and House committees.

The Tellico Project was authorized by Congress on October 15, 1966 as a multipurpose water resource and regional development project. It involves, among other things, the construction of a concrete and earthfill dam which is to create a 16,500 acre reservoir at fullpool elevation on the lower 33 miles of the Little Tennessee River. As of March 31, 1976 the main dam, spillway and auxiliary dams were 85% complete, and the entire project was about 80% complete.

The long and controversial circumstances surrounding the Tellico Project need not be recounted here as the Court has outlined the history of the project in its earlier memorandum opinions which dealt with the adequacy of the environmental impact statement filed by TVA in connection with the project. *Environmental Defense Fund* v. *Tennessee Valley Authority*, 339 F. Supp. 806 *aff'd* 468 F. 2d 1164 (1972); 371 F. Supp. 1004 *aff'd* 492 F. 2d 466 (1974). The project has continued since work was first begun in 1967, except for the delays caused by the litigation mentioned above. In excess of $78 million in public funds have been invested in the project, and if it were permanently enjoined, TVA estimates that some $53 million would be lost in nonrecoverable obligations. Some $26 million would be recoverable from the land acquired and certain highway and bridge construction and some $20 to $23 million remain to be spent on the project.

One of plaintiffs' experts, an agricultural economist, testified that "only" $30 million of the $78 million expended to date would fall into the category of non-recoverable obligations. This witness conceded on cross examination that he had only visited the project area one time in March 1976 and that he had spent only four or five hours in preparing his testimony. He also conceded that his analysis was limited to "ballpark figures"—with this we agree.

Although the evidence was conflicting on the recoverability of certain funds expended on new roads constructed in connection with the project, we are inclined to agree with defendant

that these roads will lose most of their utility if the reservoir is not impounded.

The preponderance of the evidence indicates that the $53 million figure advanced by TVA is much more realistic than the estimate of nonrecoverable obligations advanced by plaintiffs.[8]

In respect to plaintiffs' allegation that the clear-cutting of trees and foliage along the banks of the river is posing a threat to the continued existence of the snail darter because of siltation, the preponderance of the evidence showed that these operations do not pose a present threat to the snail darter. TVA has made a reasonable effort to prevent siltation, and the silt load in the river is comparable to levels which existed prior to the present clear-cutting and bulldozing operations.

In the Court's Bench Memorandum, denying plaintiffs' motion for a preliminary injunction, we stated as follows:

> In the opinion of the Court, the Endangered Species Act does apply to the Tellico Project; but whether or not Congress intended the Endangered Species Act to permit halting of the Tellico Project after approximately $80 million has been spent on it is another question, a question that will not be answered by the Court at this time.

The Endangered Species Act of 1973 became effective on December 28, 1973 more than seven years after the Tellico Project was authorized by Congress and nearly seven years after construction began. At that time more than $45 million had been appropriated for the project and over $35 million had been invested in it. *Environmental Defense Fund* v. *Tennessee Valley Authority*, 371 F. Supp. 1004, 1006. The snail darter was discovered several months before this Court approved TVA's final environmental impact statement. It was not listed as an endangered species until November 1975 and its critical habitat was not determined until April 1976.

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[8] In pretrial proceedings, plaintiffs suggested that the project could be modified to make the project area into a public recreation area and the river could be left undisturbed. Thus, say plaintiffs, such a use would inure to the benefit of the public and reduce the loss if the project were abandoned. TVA pointed out, however, that the money appropriated to it was for the Tellico Project alone and that it had no authority to use the funds other than for that purpose.

Under these circumstances, and others heretofore outlined, is it reasonable to conclude that Congress intended the Act to halt the Tellico Project at its present stage of completion? We think not. The Act should be construed in a reasonable manner to effectuate the legislative purpose. *Sierra Club* v. *Froehlke*, — F. 2d —, No. 75–1255 (8th Cir., filed April 23, 1976), Slip Opinion at 34.

At some point in time a federal project becomes so near completion and so incapable of modification that a court of equity should not apply a statute enacted long after inception of the project to produce an unreasonable result. *Arlington Coalition on Transportation* v. *Volpe*, 458 F. 2d 1323, 1331–32 (4th Cir.) *cert. den.* 409 U.S. 1000 (1972). here there has been an irreversible and irretrievable commitment of resources by Congress to a project over a span of almost a decade, the Court should proceed with a great deal of circumspection.

As stated by the district judge in *Froehlke, supra*, where

> Congress has continuously funded the [project] for a number of years through various flood control acts, this Court will not substitute its judgment for that of the elected representatives of the United States.
> (392 F. Supp. 130, 144 (E.D. Mo. 1975), *aff'd* — F. 2d —, No. 75–1255 (8th Cir., filed April 23, 1976).)

The approach we have taken has been suggested or followed in a number of cases dealing with the applicability of the National Environmental Policy Act of 1969 to ongoing federal projects. *See e.g. Pizitz* v. *Volpe*, 467 F. 2d 208 (5th Cir. 1972); *Greene County Planning Board* v. *Federal Power Commission*, 455 F. 2d 412, 424 (2d Cir.) *cert. den.* 409 U.S. 849 (1972). In this connection, Judge Tuttle stated as follows in declining to apply NEPA to a highway project more than 80% complete when the Act was passed:

> It is simply unreasonable to assume that Congress intended at this point in time, construction should halt, an environmental impact study should be made, and the highway possibly be rerouted.
> *Ragland* v. *Mueller*, 460 F. 2d 1196, 1198 (5th Cir. 1972).)

This approach has also been suggested by a commenator. Wood, *Section 7 of the Endangered Species Act of 1973: A Significant Restriction for all Federal Activities*, 5 E.L.R. 50189, 50196–97 (1975).

The Fish and Wildlife Service of the Department of the Interior has very recently promulgated guidelines to assist federal agencies in carrying out their responsibilities under § 7 of the Act. These guidelines along with a cover letter dated April 28, 1976 were introduced at trial as Exhibit 33. Part I.D. of the guidelines, entitle "Application of section 7 to Existing Activities and Programs" provides, in pertinent part, as follows:

> In considering whether section 7 applies to actions in the • • • implementation stage but not completed prior to December 28, 1973, Federal agencies, should determine if the action is • • • one being undertaken by • • • a Federal entity and substantial work remains to be done which would, independent of the effect of earlier work performed, in and of itself jeopardize the continued existence of a listed species or modify or destroy critical habitat of a listed species. If • • • such work on a Federal project remains to be performed, then the requirements of section 7 should be satisfied.

In construing a statute, the interpretation given it by an agency charged with administering it ordinarily must be given considerable weight. *Udall* v. *Tallman*, 380 U.S. 1, 16 (1965). In promulgating the guidelines, referred to above, however, the Service noted that they were intended as a "starting point" for the promulgation of regulations pursuant to normal rulemaking procedures which will afford interested parties the opportunity to comment on such proposed regulations. Further, the guidelines are to be used by federal agencies "at their discretion." Exhibit 33, pp. 2–3.

Thus, we do not take this guideline to be the Secretary's final statement of the manner in which § 7 is to be applied to ongoing projects. It may be that the guideline is directed toward ongoing projects which, with reasonable alterations, could be completed without violating § 7 of the Act. Perhaps the situation presented in this case is not contemplated by the guideline quoted above. At any rate, we are not inclined to give it much weight in its present tentative form.

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We recognize the rule that congressional approval of appropriations does not, standing alone, repeal provisions of law in effect at the time the appropriations are approved. *Environmental Defense Fund* v. *Froehlke*, 473 F. 2d 346, 353–54 (8th Cir. 1972); *Environmental Defense Fund* v. *Tennessee Valley Authority*, 468 F. 2d 1164, 1182 (6th Cir. 1972). Additionally, it is recognized that the critical habitat of the snail darter was not determined until April 1976 and that Congress has not acted on the appropriation requested in January 1976 which TVA plans to use to complete the project.

Nevertheless we believe that additional funding of the Tellico Project and a House Committee's direction to complete the project "in the public interest" after being informed by TVA that it did not construe the Endangered Species Act as preventing the project's completion is persuasive that such an interpretation of the Act is consistent with congressional intent. *Cf. Environmental Defense Fund Inc.* v. *Corps of Engineers*, 492 F. 2d 1123, 1140–41 (5th Cir. 1974); *United States ex rel TVA* v. *Two Tracts of Land*, 456 F. 2d 264, 267 (6th Cir.) *cert. den.* 409 U.S. 887 (1972). We are convinced that Congress was thoroughly familiar with the project when additional appropriations were made since it had been dealing with the project over a number of years.

Plaintiffs rely on several recent cases dealing with the Endangered Species Act in support of their contention that the Act should be applied with full force and effect to the Tellico Project. The case of *United States* v. *Cappaert*, 508 F. 2d 313 (9th Cir. 1974), *cert. granted* 422 U.S. 1041 (1975) deals only tangentially with the Act and appears to turn on the interpretation and effect of a 1952 Presidential Proclamation. 508 F. 2d at 320.

In *National Wildlife Federation* v. *Coleman*, 529 F. 2d 359 (5th Cir. 1976), the Act was applied to a highway project which began long before the Act became effective. The court enjoined further construction of a 5.7 mile segment of the highway which was to transverse the critical habitat of the Mississippi Sandhill Crane, an endangered species, pending a determination by the Secretary of the Department of Interior of what modifications are necessary to insure compliance with § 7 of the Act.

The plaintiffs in *Coleman* filed suit on May 23, 1975 and actual construction of the 5.7 mile segment in question did not

begin until September 1, 1975, with a target completion date of May 29, 1978. Additionally, the plaintiffs did not seek a permanent injunction against construction of the highway.

Thus, the *Coleman* court was faced with a case that was fundamentally different on its facts from the present case. Construction of the 5.7 mile segment was in its initial stages and relatively minor alterations to the segment were all that was necessary to effectuate full compliance with § 7. Additionally, the Mississippi Sandhill Crane had been on the endangered list since June 3, 1973 pursuant to a predecessor to the present Act.[9]

As discussed previously, impoundment of the river is integral to the entire Tellico Project and it would serve no purpose to enjoin such action pending review by the Secretary of the Department of Interior to determine what modifications would bring the project into compliance with § 7. The Secretary has made his position clear that the proposed impoundment "would result in total destruction of the snail darter's habitat." 40 Fed. Reg. a 47506.[10]

In *Sierra Club* v. *Froehlke*, *supra*, the court affirmed the district court's denial of injunctive relief in an action to halt construction of the Meramec Park Dam and other proposed dams in the Meramec Basin. The case dealt primarily with asserted violations of NEPA and the Endangered Species Act of 1973. The Indiana Bat was the endangered species involved.

The Court of Appeals affirmed the finding of the district court that the evidence failed to show that "present activities in constructing the Meramec Park Reservoir are adversely affecting Indiana bats in the project area." *Froehlke*, *supra*, slip opinion at 36.

The proof showed that only a very small number of the bats would be affected out of a total population of some 700,000.

Although the court did not deal directly with the question of the applicability of § 7 to ongoing projects, it is noted that actual construction on the project did not begin until

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[9] Endangered Species Conservation Act of 1969, Pub. L. 91–135. For a discussion of the background of the present Act, see 2 U.S. Cong. & Admin. News, 2989–2992 (1973).

[10] The issuance of a permanent injunction in this case would have far more serious ramifications than in the ordinary case arising under NEPA. In that type of case the defendant agency can often be enjoined from further construction of a project pending compliance with the requirements of NEPA which are primarily procedural in nature.

July 1974. It is also noted that the project is not scheduled to be completed and operational until June of 1980. *Froehlke, supra,* slip opinion at 6–7. Further, the Indiana Bat had been listed as endangered since 1966 under a predecessor to the present Act.[11]

Counsel for plaintiffs argues fervently that the Court has only limited discretion in determining whether or not an injunction should issue. It is asserted that the discretion of the Court is limited to fashioning a remedy to insure compliance with the Act, not to excuse a violation thereof. *See Hecht Co.* v. *Bowles,* 321 U.S. 321 (1944); *SEC* v. *Advance Growth Capital Corp.,* 470 F. 2d 40 (7th Cir. 1972); *Shafer* v. *United States,* 229 F. 2d 124 (5th Cir.), *cert. den.* 351 U.S. 931 (1956). Since Congress has expressly declared the public interest in the Endangered Species Act, the argument continues, the failure to issue an injunction will frustrate the declared congressional objectives of the Act. We cannot agree.

This case must be viewed in the context of its particular facts and circumstances. We go no further than to hold that the Act does not operate in such a manner as to halt the completion of this particular project. A far different situation would be presented if the project were capable of reasonable modifications that would insure compliance with the Act or if the project had not been underway for nearly a decade.

If plaintiffs' argument were taken to its logical extreme, the Act would require a court to halt impoundment of water behind a fully completed dam if an endangered species were discovered in the river on the day before such impoundment was scheduled to take place. We cannot conceive that Congress intended such a result.

We are not suggesting that the Endangered Species Act should be administered grudgingly by the Courts, nor that the importance of any endangered species should be minimized when compared with an extensive federal project. Balancing such interests is a legislative and not a judicial function.[12]

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[11] Endangered Species Preservation Act of October 15, 1966 (Pub. L. 89–669).

[12] Plaintiffs also argue that the injunction should issue and the question would thereby be "remanded" to Congress for it to determine if the Tellico Project should be exempted from the Act. As pointed out previously, we think that Congress has already made it clear that the project should be completed. If we are mistaken in this conclusion, it is not too late for Congress to refuse to appropriate the funds to complete the project.

Finally, we conclude that TVA has not acted arbitrarily, capriciously or otherwise not in accordance with the law in continuing further implementation of the Tellico Project. *See Citizens to Preserve Overton Park* v. *Volpe,* 401 U.S. 402 (1971). It has acted within the scope of authority given it by Congress and has informed Congress, through its committees, about the snail darter and its position on the application of the Endangered Species Act to the project.

TVA has made a good faith effort to conserve the snail darter and has consulted with other agencies about the problem rather than taking the immutable position that it was not required to comply with the Act.

In holding that the Army Corps of Engineers had not acted arbitrarily or capriciously in its decision to build the Gillham Dam, the Court of Appeals for the Eighth Circuit stated as follows:

> "We have also taken into account, as we must, that the overall project was authorized by Congress eleven years prior to the passage of NEPA, and was sixty-three percent completed at the date this action was instituted. Almost ten million dollars has been expended and would be lost if the project were completely abandoned now." *Environmental Defense Fund* v. *Corps of Engineers,* 470 F. 2d 289 (1972) *cert. den.* 412 U.S. 931 (1973).

For the foregoing reasons, we conclude that plaintiffs' prayer for a permanent injunction must be denied and the action dismissed.

Order Accordingly.

ROBERT TAYLOR,
United States District Judge.

[Caption Omitted]

[Filed May 25, 1976]

Order

For the reasons stated in a Memorandum this day passed to the Clerk, it is ORDERED that the plaintiffs' request for a permanent injunction in this action be, and the same hereby is, denied.

It is further ORDERED that the action be, and the same hereby is, dismissed on the merits.

Enter:

ROBERT TAYLOR,
United States District Judge.

(48)

[Caption Omitted]

Notice of Appeal

Notice is hereby given that Hiram G. Hill, Jr., Zygmunt J. B. Plater, Donald S. Cohen, The Audubon Council of Tennessee, Inc. and The Association of Southeastern Biologists, the plaintiffs above named, hereby appeal to the United States Court of Appeals for the Sixth Circuit in Cincinnati, Ohio, from the Order and Memorandum entered in this action on the 25th day of May, 1976.

Dated this 2nd day of June, 1976.

HIRAM G. HILL, Jr.
ZYGMUNT J. B. PLATER.
DONALD S. COHEN.
THE AUDUBON COUNCIL OF TENNESSEE, INC.
THE ASSOCIATION OF SOUTHEASTERN BIOLOGISTS.
By: W. P. BOONE DOUGHERTY,
Attorney for Plaintiffs,
1200 Hamilton National Bank Building,
Knoxville, Tennessee.

(49)

[Caption Omitted]

Bond for Costs on Appeal

KNOW ALL MEN BY THESE PRESENTS: That we, Hiram G. Hill, Jr., Zygmunt J. B. Plater, Donald S. Cohen, The Audubon Council of Tennessee, Inc. and The Association of Southeastern Biologists, as Principals, and Bernstein, Dougherty and Susano, Attorneys at Law, as Surety, are held and firmly bound unto Tennessee Valley Authority in the full and just sum of Two Hundred Fifty Dollars ($250.00) to be paid to the said Tennessee Valley Authority, its successors or assigns; to which payment, well and truly to be made, we bind ourselves, our successors, assigns, heirs, executors and administrators jointly and severally by these presents. Sealed without seals and dated this 2nd day of June, 1976.

WHEREAS, on May 25, 1976, in an action pending in the United States District Court for the Eastern District of Tennessee, Northern Division, between Hiram G. Hill, Jr., Zygmunt J. B. Plater, Donald S. Cohen, The Audubon Council of Tennessee, Inc. and the Association of Southeastern Biologists as plaintiffs and Tennessee Valley Authority as defendant, an Order and Memorandum were entered against the said plaintiffs and the said plaintiffs having filed a Notice of Appeal from said Order and Memorandum to the United States Court of Appeals for the Sixth Circuit;

NOW, THEREFORE, the condition of this obligation is such that if the said plaintiffs shall prosecute their appeal to effect and shall pay costs if the appeal is dismissed or the Judgment affirmed or such costs as the Court of Appeals may award against said plaintiffs if the Judgment is modified, then this

obligation to be voided; otherwise, to remain in full force and effect.

HIRAM G. HILL, Jr.
ZYGMUNT J. B. PLATER.
DONALD S. COHEN.
THE AUDUBON COUNCIL OF TENNESSEE, INC.
THE ASSOCIATION OF SOUTHEASTERN BIOLOGISTS.

By: .....
Principals.

BERNSTEIN, DOUGHERTY & SUSANO.

Of Counsel:
W. P. BOONE DOUGHERTY,
BERNSTEIN, DOUGHERTY & SUSANO,
1200 Hamilton National Bank Building,
Knoxville, Tennessee.

[Caption Omitted]

Motion for Injunction Pending Appeal From Order Denying Injunction

Upon the complaint and all the briefs and other relevant material filed by the parties, and all the proceedings in this action to date, the plaintiffs respectfully move this Court for an order restraining defendants, pending the hearing and determining of plaintiffs' appeal to the United States Court of Appeals for the Sixth Circuit from the judgment of this Court entered May 25, 1976 dismissing the claim herein, from construction, excavation, tree-cutting and other project activities that would destroy or alter critical habitat or jeopardize the existence of the snail darter *Percina* (*Imostoma*) *tanasi* in violation of the Endangered Species Act; 16 USC 1531 et seq., and for other further relief as the Court deems just.

W. P. Boone Dougherty,
1200 Hamilton Natl. Bank Building,
Knoxville, Tennessee 37902,
Tel. (615) 546–8030,
Attorney for Plaintiffs.

Of Counsel:
Bernstein, Dougherty & Susano.

[Caption Omitted]

[Filed June 9, 1976]

Response of Tennessee Valley Authority to Plaintiffs' Motion for Injunction Pending Appeal

For reasons stated in more detail in the accompanying brief, and in the annexed affidavit of George H. Kimmons (Exhibit "A" hereto), defendant TVA opposes plaintiffs' motion for an injunction to halt further construction of the Tellico project pending appeal on the following grounds:

1. Plaintiffs have failed to satisfy any of the prerequisites for obtaining such an injunction.

2. The halting of construction in this project at this critical season of the year for a period of one month would delay closure of the dam by about six months and cause monetary damages to TVA in the amount of approximately $1,000,000. Halting construction for a period of four months would delay closure of the dam by approximately one year and cause monetary damages to TVA of approximately $6,300,000.

It is accordingly requested that plaintiffs' motion be denied.

Respectfully submitted,

Herbert S. Sanger, Jr.,
General Counsel,
Tennessee Valley Authority,
Knoxville, Tennessee.
Charles A. Wagner III,
Assistant General Counsel.
Thomas A. Pedersen,
Nicholas A. Della Volpe,
Attorneys for Defendant.

[Filed June 9, 1976]

United States District Court for the Eastern District of Tennessee, Northern Diviion

Civil Action, No. 3-76-48

HIRAM G. HILL, JR., ZYGMUNT J. B. PLATER, DONALD S. COHEN, THE AUDUBON COUNCIL OF TENNESSEE, INC., AND THE ASSOCIATION OF SOUTHEASTERN BIOLOGISTS, PLAINTIFFS

v.

TENNESSEE VALLEY AUTHORITY, DEFENDANT

Brief of Tennessee Valley Authority in Opposition to Injunction Pending Appeal

Plaintiffs, having failed to prove that they were entitled to a preliminary injunction pending trial, and having failed to prove that they were entitled to an injunction after a trial on the merits, now seek to obtain the identical relief already twice denied by asking the Court to grant them an injunction pending appeal. Their situation is the same as that of the plaintiffs in *Sierra Club* v. *Lynn*, 364 F. Supp. 834 (W.D. Tex. 1973), in which the court denied plaintiffs' motion for an injunction pending appeal saying:

> Not only have the plaintiffs failed to demonstrate that irreparable damage will result if the injunctive relief is not continued, but this Court does not believe that the record in this case would support a finding that there is a strong likelihood that plaintiffs will succeed in an appeal on the merits. Certainly, it would be the height of inconsistency for this Court to determine after a nine day trial that no irreparable damage to the aquifer will result if the project proceeds, and then enjoin the project because irreparable damage will result if the project is not halted. An injunction in the present case would, in practical effect award to plaintiffs the

> identical relief already denied to them on the merits of the case [at 852].[1]

To the same effect is *Environmental Defense Fund, Inc.* v. *Froehlke*, 368 F. Supp. 231 (W. D. Mo. 1973), *aff'd sub nom. Environmental Defense Fund, Inc.* v. *Callaway*, 497 F. 2d 1340 (8th Cir. 1974), involving the Truman Dam, in which the court said:

> We expressly found and concluded in our memorandum and order of October 18, 1972, that "the public interest would not be served should we grant to plaintiffs precisely the form of blanket relief pending appeal which we refused to grant them on the merits." Following that order, plaintiffs sought and were refused an injunction pending appeal by the Eighth Circuit on November 21, 1972, and by the Supreme Court on December 18, 1972 [at 256].

Plaintiffs' principal argument is that the Sixth Circuit may not hear the case until October or thereafter; and as a consequence, they would be faced with a mooted issue. We think it would be inappropriate for this Court to grant an injunction based on speculation as to when the Sixth Circuit would schedule this case. It must be assumed that the appellate court will schedule the case as appropriate. Moreover, it is virtually undisputed that neither the snail darter nor its habitat will be affected until the dam is closed in January 1977. The Court specifically found in its memorandum opinion that:

> In respect to plaintiffs' allegation that the clear-cutting of trees and foliage along the banks of the river is posing a threat to the continued existence of the snail darter because of siltation, the preponderance of the evidence showed that these operations do not pose a present threat to the snail darter. TVA has made a reasonable effort and prevent siltation, and the silt load in the river is comparable to levels which exister prior to the present clearcutting and bulldozing operations [at 15].

An injunction pending appeal is an extraordinary remedy which is granted only upon a clear showing that plaintiff has met the necessary requirements. The prerequisites for obtain-

[1] Emphasis added herein unless otherwise noted.

ing such an injunction are well stated in *Long* v. *Robinson*, 432 F. 2d 977 (4th Cir. 1970):

> Briefly stated, a party seeking a stay must show (1) that he will likely prevail on the merits of the appeal, (2) that he will suffer irreparable injury if the stay is denied, (3) that other parties will not be substantially harmed by the stay, and (4) that the public interest will be served by granting the stay [at 979].

These basic prerequisites are well-established law. *North Cent. Truck Lines, Inc.* v. *United States*, 384 F. Supp. 1188, 1190–91 (W.D. Mo. 1974) *aff'd.* 420 U.S. 901 (1975); *Virginia Petroleum Jobbers Ass'n* v. *Federal Power Comm'n*, 259 F. 2d 921 (D.C. Cir. 1958); *Alpine Lakes Protection Soc'y* v. *Schlapfer*, 518 F. 2d 1089 (9th Cir. 1975); *Belcher* v. *Birmingham Trust Nat'l Bank*, 395 F. 2d 685, 686 (5th Cir. 1968); *Hamlin Testing Laboratories, Inv.* v. *United States Atomic Energy Comm'n*, 337 F. 2d 221, 222 (6th Cir. 1964); *Adams* v. *Walker*, 488 F. 2d 1064 (7th Cir. 1973); *Environmental Defense Fund, Inc.* v. *Froehlke*, 348 F. Supp. 338, 366 (W.D. Mo.), *application for injunction pending appeal denied*, 409 U.S. 1072 (1972), *aff'd* 477 F. 2d 1033 (8th Cir. 1973) (Truman Dam); *Sierra Club* v. *Lynn*, 360 F. Supp. 844, 852 (W.D. Tex. 1973). *See generally* 7 J. Moore, *Federal Practice* ¶ 62.05 (2d ed. 1975). Plaintiffs cannot establish any of these prerequisites.

1. *Plaintiffs' likelihood of success.* Since an injunction pending appeal is an extraordinary remedy, the movant must make a "*strong*" showing that he will prevail on the merits of his appeal. *Hamlin Testing Laboratories, Inc.* v. *United States Atomic Energy Comm'n*, 337 F. 2d 221 (6th Cir. 1964); *Adams* v. *Walker*, 488 F. 2d 1064 (7th Cir. 1973); *Belcher* v. *Birmingham Trust Nat'l Bank*, 395 F. 2d 685 (5th Cir. 1968); *Miltenberger* v. *Chesapeake & O. Ry.*, 450 F. 2d 971 (4th Cir. 1971); *North Cent. Truck Lines, Inc.* v. *United States*, 384 F. Supp. 1188 (W.D. Mo. 1974), *aff'd*, 420 U.S. 901 (1975); *Sierra Club V. Lynn*, 364 F. Supp. 834 (W.D. Tex. 1973).

Plaintiffs have failed to state any legal or factual contentions which would justify this Court in entertaining any serious doubt as to the correctness of its decision in this case. Their mere unsupported assertion that " 'likelihood of success on the merits' is not a standard for issuance of an injunction pending an appeal, since by definition the District Court has already indicated its view on the plaintiffs' merits in its adverse decision," cannot operate to change the law or relieve them of that burden.

2. *Irreparable injury to plaintiffs.* As pointed out previously, neither the snail darter nor its habitat will be affected until closure of the dam in January 1977; and since the only purpose of this suit is to protect the snail darter, it is obvious that plaintiffs cannot suffer "irreparable injury" until that event occurs. The situation here is the same as it was in the Truman Dam case (348 F. Supp. 338) in which the court said:

> Substantial environmental damage can occur under the circumstances of this case only when the dam is closed and the Osage River is no longer a free-flowing stream [at 354].

3. *Harm to defendant.* Plaintiffs' assertion that an injunction "will not seriously burden the defendants" because TVA is using its own personnel and equipment "which can be easily used elsewhere" is utterly false. As shown in the affidavit of George H. Kimmons, these employees and equipment cannot be transferred elsewhere; and an injunction for a period of one month would delay closure of the dam by six months and cost TVA $1,000,000, while an injunction for a period of four months would delay closure by one year and cost TVA $6,300,000.

4. *The public interest.* Plaintiffs argue that "[t]he public interest would be served not hampered by a delay" because the public interest is threatened by ongoing construction which results in "destruction of existing agricultural, recreational, historical, touristic features of the Little Tennessee Valley." This argument is both baseless and irrelevant. It is baseless because Congress has decided that it is in the public interest to construct the project in order to realize the benefits of navigation, flood control, water supply, electric power, recreation, creation of jobs, etc. It is irrelevant because (1) it has nothing to do with this action which involves the snail darter and the Endangered Species Act of 1973; and (2) the impacts on agricultural, recreational, historical, and touristic features were the subject of the earlier Tellico litigation. After a trial on the merits in Tellico II, both this Court and the Sixth Circuit

denied plaintiffs' request for an injunction pending appeal and held that the Tellico project could go forward.

The following remarks from Truman Dam (368 F. Supp. 231) are approperiate here:

> • • • "the public interest would not be served should we grant to plaintiffs precisely the form of blanket relief pending appeal which we refused to grant them on the merits" [at 256].

CONCLUSION

For the foregoing reasons, and under all the circumstances of this case, we respectfully submit that the Court, in the exercise of its sound judicial discretion, should deny plaintiffs' request for an injunction pending appeal.

Respectfully submitted,

HERBERT S. SANGER, Jr.,
General Counsel,
Tennessee Valley Authority,
Knoxville, Tennessee.
CHARLES A. WAGNER III,
Assistant General Counsel.
THOMAS A. PEDERSEN,
NICHOLAS A. DELLA VOLPE,
Attorneys for Defendant.

[Caption Omitted]

AFFIDAVIT OF GEORGE H. KIMMONS

STATE OF TENNESSEE
County of Knox, } ss:

GEORGE H. KIMMONS, being first duly sworn, deposes and says:

I am 57 years of age and reside at Route 3, Williams Road, Concord, Tennessee. I am a graduate engineer from the University of Mississippi and have been employed by the Tennessee Valley Authority as an engineer since 1941. My present position is Manager of the Office of Engineering Design and Construction, in which capacity I have responsibility for the design and construction of all projects built by TVA, including the Tellico project. The matters herein stated are based on my personal knowledge and are true.

The Tellico project is about 80 percent complete with dam closure scheduled for January 1977. Work currently in progress on the project includes placement of fill for the earthfill section of the dam, installation of spillway gates in the concrete section, excavation of the canal which will connect the Tellico Reservoir with the existing Fort Loudoun Reservoir, relocation of highways and bridges, reservoir clearing, utility and cemetery relocations, saddle dam construction, and archaeological investigations and protection.

The 690 TVA employees engaged in this work consist of 48 engineering and supervisory employees and 642 skilled and unskilled craft employees with a total monthly payroll of over $1 million. In addition, some 41 employees of independent contractors are participating in the work. TVA's construction equipment with a value of about $6.5 million is now working on the project.

The placement of earthfill for the earth dam section is the most critical remaining work item. Over 1.3 million cubic yards of fill must be placed before the dam closure in January 1977. The normal earthmoving season in this region is from the mid-

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dle of April until the first of December, but the optimum season is just now beginning. A one-month work suspension at this critical time would likely delay closure of the dam by six months or more. A four-month suspension would cause loss of the complete work season and delay dam closure by about one year. Inability to place the fill in the 1976 work season would leave the partially completed earth dam vulnerable to flood damage with probably loss of considerable fill already in place.

The cost of a one-month suspension of work is estimated at $1 million; the cost of a four-month work suspension is estimated at $6.3 million. These costs include shutdown costs, standby costs, work resumption costs, and price escalations.

Work shutdown costs consist of the transfer of supervisory staff (if possible), termination of craft employees, depreciation and maintenance of unused contruction equipment, damages to contractors for demobilization, and the placing of the project in standby status. Only a few of the supervisors and very little equipment could be transferred to other projects because all other projects are adequately equipped and staffed.

Standby costs consist of making provisions for security, loss from non-use of equipment, and job surveillance.

Work resumption costs consist of transferring supervisory staff, re-employment of craft workers, job cleanup, replacement of earthfill lost from flooding, loss of productivity during the re-buildup period, and damages to contractors for remobilization.

Price escalation consists of the effects of escalating prices during the period of work suspension. Construction prices are currently escalating at a rate of 9 to 10 percent per year.

The above costs do not include those which would result to the public as a consequence of the delay in realizing the benefits of the completed project.

(S) George H. Kimmons.
GEORGE H. KIMMONS.

Sworn to and subscribed before me this 7th day of June, 1976.

[SEAL] ANITA G. DELIUS,
Notary Public.

My commission expires: 10/13/78.

[Caption Omitted]

Filed June 10, 1976

Order

For the reasons stated in a Memorandum Opinion filed in this case on the 25th day of May, 1976, it is ORDERED that plaintiffs' motion for an injunction pending appeal be, and the same hereby is, denied.

Enter:

ROBERT TAYLOR,
United States District Judge

(61)

[Caption Omitted]

Designation by Appellants of Transcript for Appeal

The appellants designate that the entire transcript should be designated and included as a part of the record on appeal.
This 11th day of June, 1976.

.....
Attorney for Appellants.

OF COUNSEL:
W. P. BOONE DOUGHERTY,
BERNSTEIN, DOUGHERTY & SUSANO,
1200 Hamilton National Bank Bldg.
Knoxville, Tennessee 37902.

United States Court of Appeals for the Sixth Circuit

No. 76-8129

HIRAM G. HILL, Jr., ZYGMUNT J. B. PLATER, DONALD S. COHEN, THE AUDUBON COUNCIL OF TENNESSEE, INC. AND THE ASSOCIATION OF SOUTHEASTERN BIOLOGISTS, PLAINTIFFS-APPELLANTS, *v.* TENNESSEE VALLEY AUTHORITY, DEFENDANT-APPELLEE

Order

Upon consideration of the appellants' motion for injunction pending appeal, it is ORDERED that the motion be and it hereby is granted.

It is further ORDERED that the appeal herein be assigned for oral argument in the October, 1976 session of this Court.

Entered by Order of the Court,

JOHN P. HEHMAN,
Clerk.

By: GRACE KELLER,
Chief Deputy.

No. 76-8129

UNITED STATES COURT OF APPEALS

FOR THE SIXTH CIRCUIT.

FILED

AUG 2 1976

JOHN P. HEHMAN, Clerk

HIRAM G. HILL, JR., et al,

Plaintiffs-Appellants

vs

TENNESSEE VALLEY AUTHORITY

Defendant-Appellee

O R D E R.

The Motion for Reconsideration of the Injunction Pending Appeal heretofore issued by this Court, was argued orally by counsel representing both sides, in the Chambers of a Judge of this Court, in Akron, Ohio, on July 29, 1976.

In order to allow time for the consideration and determination of the Motion for Reconsideration, it was then ordered that the injunction heretofore entered on July 26, 1976 be stayed until August 4, 1976.

It appears that District Judge Taylor denied a temporary restraining order and a preliminary injunction prayed for by the plaintiffs, and also denied to plaintiffs an injunction pending appeal. He declined to apply the Endangered Species Act to the Tellico Dam project because the project had been authorized by Congress in

1966 and the Endangered Species Act (16 U.S.C. § 1531 et seq.) did not become effective until December 28, 1973, which was more than seven years later.

The snail darter was not discovered until August 12, 1973 at approximately River Mile 7 of the Little Tennessee River.[1] It was later designated as an endangered species and its critical habitat was determined by the United States Fish and Wildlife Office of the Department of Interior, on May 3, 1976, at River Miles 5 to 17 of the Little Tennessee River.

The project is now about eighty per cent (80%) completed, and millions of dollars have already been spent on the estimated total cost of one hundred million dollars ($100,000,000). T.V.A. plans to complete the entire project in January 1977.

The motion of the plaintiffs was to enjoin T.V.A. from continuing tree cutting, excavation, ground clearing and construction in connection with the Tellico Reservoir. This was in substance, the same injunctive relief which plaintiffs sought in the District Court.

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1 The snail darter was so named because it is a small tannish-colored fish which feeds on little snails lying on the bottom of the river.

Judge Taylor found by a preponderance of the evidence that the clear cutting of trees and foliage along the banks of the river does not pose a present threat to the snail darter. He further found that T.V.A. had made a reasonable effort to prevent siltation; that the silt load in the river is comparable to levels which existed prior to the clear cutting and bulldozing operations. It would of course, be expected that T.V.A. would continue with its efforts in this respect without any order from us. Judge Taylor further found that the closure of the Tellico Dam in January 1977 and consequent creation of the Tellico Reservoir would result in adverse modification if not complete destruction of the snail darter's habitat, and this would lead to the destruction of the species. Thus, it is not the construction project, but the closure of the dam when completed, which will result in the destruction of the snail darter.

The District Judge was impressed by the fact that the parties had appeared before Appropriation Committees of Congress to express their views on continuing with the project, and that Congress had continued to appropriate funds for the completion of the project. The effect of all this can be determined

only when the case is heard on its merits.

The District Judge further found that in continuing further implementation of the project, T.V.A. had acted within the scope of authority granted to it by Congress and in no respect did it act arbitrarily, capriciously or other than in good faith. The Court pointed to sincere efforts made by T.V.A. to conserve the snail darter, and had consulted with other governmental agencies. Counsel for T.V.A. at the oral hearing advised the Court that T.V.A. has already spent three hundred thousand dollars ($300,000) in its conservation efforts, which included trying to find a new habitat for the fish.

It would appear to the Court on reconsideration, that the injunction pending appeal heretofore granted, was too broad. It enjoined further construction when the evidence is now clear that the only conduct which would result in destruction of the fish is closure of the dam. It did not take into account the probability of damage to the government as the owner of T.V.A., if construction is delayed during the present dry season, and the fact that more than seven hundred men would be put out of work. In the event the injunction

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pending appeal be later held to have been improvidently granted, the government would have difficulty in recovering damages because the injunction was issued without bond.

The findings of fact adopted by the District Judge have not been shown to be unsupported by substantial evidence or to be clearly erroneous. For the purpose of this Motion, they are binding on the Court.

IT IS THEREFORE ORDERED that the injunction pending appeal heretofore entered on July 26, 1976, be and it is hereby modified so as to enjoin, pending appeal, any closure of the dam.

Paul C. Weick
United States Circuit Judge

IN THE
UNITED STATES COURT OF APPEALS
FOR THE SIXTH CIRCUIT

MIRAM C. HILL, JR., ZYGMUNT J. B. PLATER, DONALD S. COHEN, THE AUDUBON COUNCIL OF TENNESSEE, INC., and THE ASSOCIATION OF SOUTH-EASTERN BIOLOGISTS Appellants v. TENNESSEE VALLEY AUTHORITY Appellee	No. 76-2116

SUPPLEMENTAL ANSWERS TO QUESTIONS ASKED DURING ORAL ARGUMENT

The Court during oral argument asked several questions to which TVA believes further responses will materially facilitate the Court's consideration of the case. The following are TVA's complete responses to those questions:

1. Q. The Court's initial question was what is the status of TVA's transplant program.

   A. As a part of a transplant program already involving an expenditure of over $300,000, TVA transplanted over 700 snail darters to the Hiwassee River beginning in June 1975. At the trial, TVA presented evidence that the reproductive development of snail darters in the Hiwassee River paralleled that of the darters in the Little Tennessee River; but at that time, TVA was unable to offer evidence that reproduction had actually occurred in the Hiwassee River. Judge Taylor found in his May 25, 1976, opinion that "the transplant may or may not be successful since there is no conclusive proof that the

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700 snail darters will reproduce in their new environment" (Opinion at 8). Since that time, beginning in August 1976, TVA biologists have returned to the Hiwassee River and with limited searching have sighted over a dozen young-of-the-year (less than one year old) snail darters, thus indicating that the fish are reproducing in the Hiwassee. Several young-of-the-year fish have been captured in the Hiwassee River under a U.S. Fish and Wildlife Service permit for further scientific study.

This is the strongest possible indication of a successful transplant; however, it is only fair to note that biologists generally consider several years of data necessary before they can form a conclusive judgment on the success of a transplant.

2. Q. The Court asked whether application of the Endangered Species Act to the Tellico project, due to its advanced stage of completion, would constitute an impermissible retroactive application.

A. TVA contended in the district court and still contends that due to Tellico's advanced stage of construction at the time the Act was enacted, at the time the snail darter was discovered, and at the time the snail darter was listed as endangered, the application of the Endangered Species Act to the Tellico project would be an impermissible retroactive application not intended by Congress. The district court did hold that the Endangered Species Act is applicable in the abstract to the Tellico project; but it also held that because of the stage of completion and the other circumstances of this case, it did not apply retroactively to halt Tellico's completion. Judge Taylor specifically held:

> At some point in time a federal project becomes so near completion and so incapable of modification that a court of equity should not apply a statute enacted long after inception of the project to produce an unreasonable result. Arlington Coalition on Transportation v. Volpe, 458 F.2d 1323, 1331-32 (4th Cir.) cert.den. 409 U.S. 1000 (1972). Where there has been an irreversible and irretrievable commitment of resources by Congress to a project over a span of almost a decade, the Court should proceed with a great deal of circumspection [Opinion at 17].

The Senate Appropriations Committee was of the same opinion saying:

> The Committee does not view the Endangered Species Act as prohibiting the completion of the Tellico project at its advanced stage and directs that this project be completed as promptly as possible in the public interest [S. Rep. No. 94-960, 94th Cong., 2d Sess. 96 (1976)].

Indeed, Judge Weick, in his order modifying the injunction pending appeal, noted that Judge Taylor "declined to apply the Endangered Species Act to the Tellico Dam project because the project had been authorized by Congress," over seven years before the effective date of the Act. We believe this holding was entirely proper in this case and it is TVA's position that the application of the Endangered Species Act to halt a validly authorized project begun over seven years before the effective date of the Act, without any judicial weighing and balancing and without applying the rule of reason (both of which are clearly allowed under the cases construing NEPA), would constitute an impermissible retroactive application not intended by Congress.

3. Q. The Court inquired why TVA has not sought a specific exemption from the Endangered Species Act for the Tellico project.

A. No exemption was requested because it was and is TVA's position that a specific exemption is not required. What

TVA did was to give Congress our construction of the Act as applied to the Tellico situation. As TVA Chairman Aubrey J. Wagner told Congress at the appropriation hearings this year:

> It is TVA's position that the ultimate decision to proceed with this project rests with TVA, and that TVA has acted responsibly, and in good faith in reaching its decision to complete the project. We believe that Congress did not intend the Endangered Species Act to be retroactively applied to existing projects like Tellico, which was over 50 percent complete at the time of the act's passage and the fish's discovery, and which was 70 to 80 percent complete at the time of the official listing of the snail darter as an endangered species. Even if applicable to Tellico, TVA construes section 7 of the Endangered Species Act to require Federal agencies to take reasonable measures, in consultation with the Secretary of the Interior, to conserve endangered or threatened species of fish, wildlife, and plants. The act was not intended to supplant an agency's primary responsibilities, or to repeal prior congressional approval and funding of authorized projects, such as Tellico, because the habitat of an endangered species would be altered or destroyed by completion of the project. TVA certainly does not construe the act as a mandate to halt an authorized project without regard to its stage of completion or the fact that $80 million in public funds has been appropriated by Congress and invested in a regional development project to provide flood control, navigation, hydroelectric power, water supply, and to produce other benefits, including recreation, fish and wildlife use, shoreline development, new job opportunities, industrial development, and to foster improved economic conditions in an area characterized by underutilization of human resources and out-migration of young people [App. B-1 at 261, App. B-2 at 3098-99; emphasis added].

Congress ratified and acquiesced in TVA's and Judge Taylor's interpretation of the Act. See S. Rep. No. 94-960, 94th Cong., 2d Sess. 96 (1976), quoted in TVA's brief at page 7.

Unlike the Bureau of Reclamation, the Corps of Engineers, and other federal agencies, TVA does not obtain special authorizing legislation for dams and reservoirs before seeking appropriations to construct them. Sections 4(j) and 27 of the TVA Act (16 U.S.C. §§ 831c(j), 831z (1970)) are general authorizing legislation for such projects.

Section 4(j) provides that TVA

> [s]hall have power to construct such dams, and reservoirs, in the Tennessee River and its tributaries, as in conjunction with Wilson Dam, and Norris, Wheeler, and Pickwick Landing Dams, now under construction, will provide a nine-foot channel in the said river and maintain a water supply for the same, from Knoxville to its mouth, and will best serve to promote navigation on the Tennessee River and its tributaries and control destructive flood waters in the Tennessee and Mississippi River drainage basins; and shall have power to acquire or construct power houses, power structures, transmission lines, navigation projects, and incidental works in the Tennessee River and its tributaries, and to unite the various power installations into one or more systems by transmission lines.

Section 27 provides that:

> All appropriations necessary to carry out the provisions of this [Act] are authorized.

The appropriations committees accordingly play a rather unique role with regard to TVA projects of this type, since they alone recommend to Congress whether such projects should or should not be built. It is to these committees, therefore, that TVA took the Tellico question.

4. Q. The Court asked whether TVA's appropriations specify the projects or activities for which given amounts of funds appropriated to TVA may be used, or whether TVA receives a lump sum appropriation which it is free to apply among projects or activities as it sees fit. The Court also asked whether the General Accounting Office reviews TVA's expenditures from its appropriations.

   A. As to the first point, TVA receives appropriations in a lump sum form; but the President's budget, as submitted to Congress, breaks down the amount requested by the President for TVA into specific sums for specific projects or activities; and the reports of the appropriations committees accompanying the appropriations bills as

submitted to the House and Senate, respectively, contain similar breakdowns. TVA is not free to depart in any substantial degree from the amounts set out in the TVA reports. It did so once in Fiscal Year 1948 as a result of a misunderstanding of different actions of the House a and Senate committees. The Senate committee made its displeasure very clear during the hearings on the appropriations for the following fiscal year, and the Chairman of the Board, Mr. Gordon Clapp, assured the committee that it would never happen again. Printed pages from the 1949 Senate committee hearings (pp. 51-54) are attached.

In order to further clarify this situation, we are attaching copies of the following:

1. The portion "The Budget of the United States Government Fiscal Year 1977, Appendix," pertaining to TVA (pp. 796-800). The tables of the Capital Outlay on page 798 and Application of Appropriations on page 799 specify that $9,700,000 of the total amount requested is to be committed during Fiscal Year 1977 for Tellico Dam and Reservoir. (The narrative statement on page 797 shows that of the total commitment of $9,700,000, a total of $9,550,000 will be expended during Fiscal Year 1977 with the remaining $150,000 to be expended in the following fiscal year.)

2. Pertinent pages (cover sheet, 4, 24-28) from the Tennessee Valley Authority "Budget Program--Justification of Programs and Estimates for the Fiscal Year Ending September 30, 1977, supplied by TVA to Congress in support of the appropriation requested for Tellico contained in the President's budget.

3. Pertinent pages (1, 82-84) from the report of the House Appropriations Committee, H.R. Rep. No. 94-1223, 94th Cong., 2d Sess. (1976).

4. Pertinent pages (1, 95-96) from the report of the Senate Appropriations Committee, S. Rep. No. 94-960, 94th Cong., 2d Sess. (1976).

5. Pertinent pages (1, 11) from the Appropriations Act, Pub. L. No. 94-355, 90 Stat. 889 (1976).

The General Accounting Office does review and report directly to Congress on TVA's expenditures. Section 9(b) of the TVA Act (16 U.S.C. § 831h(b)(1970; Supp. V, 1975)) provides in pertinent part as follows:

> The Comptroller General of the United States shall audit the transactions of the Corporation at such times as he shall determine, but not less frequently than once each governmental fiscal year, with personnel of his selection.

The Government Corporation Control Act (31 U.S.C. § 841 (1970)) expressly states the policy applicable to all wholly owned government corporations, including TVA:

> It is declared to be the policy of the Congress to bring Government corporations and their transactions and operations under annual scrutiny by the Congress and provide current financial control thereof.

This Act provides a comprehensive scheme for the submission of agency budget programs and of annual audits and reports by the Comptroller General which are required to be furnished to Congress (31 U.S.C. §§ 847-51 (1970; Supp. V, 1975)).

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5. Q. The Court asked what precedential effect this decision would have and whether upholding Judge Taylor's decision would somehow limit the strength of the Endangered Species Act for the future.

A. The precedential effect of this decision is narrow at best. Judge Taylor was careful to restrict his decision to the "particular facts and circumstances" of the Tellico case:

> We go no further than to hold that the Act does not operate in such a manner as to halt the completion of this particular project. A far different situation would be presented if the project were capable of reasonable modifications . . . or if the project had not been underway for nearly a decade [Opinion at 23].

Judge Taylor's decision could only have precedential value when all the following factors are present: (1) Project authorized and begun many years before the effective date of the Act; (2) Species in question discovered many years after the project authorized and begun; (3) Species listed as endangered when project nearly complete; (4) No alternatives available short of scrapping the project to avoid effect on species; and (5) Project being completed under supervision of Congress.

Respectfully submitted,

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Attorneys for Appellee

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IN THE
UNITED STATES COURT OF APPEALS
FOR THE SIXTH CIRCUIT

civil

MIRAM G. HILL, JR., ZYGMUNT J. B. PLATER, DONALD S. COHEN, THE AUDUBON COUNCIL OF TENNESSEE, INC., AND THE ASSOCIATION OF SOUTH-EASTERN BIOLOGISTS	)	
Appellants	)	No. 76-2116
v.	)	
TENNESSEE VALLEY AUTHORITY	)	
Appellee	)	

RESPONSE OF PLAINTIFFS-APPELLANTS TO DEFENDANTS-APPELLEES' POST-ARGUMENT SUPPLEMENTAL ANSWERS

Plaintiffs were highly appreciative of the Court's expedited consideration of this case, and wish, in responding to defendants extension of answers, to avoid any further delay in resolving the Endangered Species Act's conflict with the Tellico Project.

This response formalizes plaintiffs' comments contained in a letter to the clerk filed October 22, 1976. As defendants note, their supplemental answers are extensions of arguments previously presented in their brief and at the hearing. No new issues are raised, and no new arguments are presented. Accordingly nothing in defendants' motion, or this response thereto, need operate to delay this Court's resolution of the case.

Briefly noting defendants' contentions:

1. Transplantation efforts -- Defendants note ongoing transplant efforts. If a transplant were to prove successful, however, (and TVA admits that this can not be known for several years), it would not eliminate the statute's application to The Little Tennessee River population of the species. The latter would still be the majority population of the endangered species, and The Little Tennessee River would remain the species' "critical habitat" under the Act. The Act does not provide for transplantation as a substitute for compliance with its terms.

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Thus, if the transplant is relevant at all it is relevant not to judicial application of the Act, but to future Congressional deliberation whether on balance to exempt the project or to shift to alternative development uses.

2. Implied exemption for ongoing projects -- This repeats defendants' opposition to the principle of applying a statute where substantial agency actions in conflict with a statutory purpose remain to be taken at the time a violation occurs. They thus disagree with this Court's holdings in prior cases, noted more fully in Plaintiffs' Brief, page 33.

3. "Implied amendment by appropriation - why didn't TVA go to Congress for an amendment." -- This repeats prior arguments. It adds the implication that because TVA projects are self-authorized and "appropriations committees . . . play a rather unique role with regard to TVA . . ." that appropriation committees can impliedly amend federal statutes to exempt TVA, via legislative history and without statutory amendment as other agencies would require. This is a novel argument going beyond prior caselaw, which has always in the past required that implied amendments via appropriations acts be "manifestly clear from both the language of the act and the legislative history." Reply Brief at page 4.

4. Lump sum appropriations materials. Defendants' appendix documents are apparently intended to show Congressional consideration of the Tellico issue. The exhibits, however, are legislative background documents, not statutory material, and the Tellico project is restricted to one-line notations in a mass of general budget items except for a single paragraph in a Senate appropriations committee report. The one-line notations make no mention of conflict with the Act.

In fact, since TVA appropriations are lump sum grants, and TVA does not require specific Congressional authorization for their projects, defendants' documents show that Congress has never even considered legislation that mentioned the Tellico project by name. To permit these notations to create implied amendments of a federal statute would be a major departure from established principles of statutory construction.

Defendants note that GAO audits TVA's bookkeeping. GAO has not done a public benefit analysis of the Tellico project.

5. Undesirable precedent. Defendants argue that this Court's failure to enforce the Act would not establish undesirable precedent. Defendant's conclusion, however, presumes their arguments. A decision denying an injunction would stand as precedent for

(a) a judicial exemption from the Endangered Species Act without any findings as to unavailability of alternatives (defendants 5(4); plaintiffs' brief 28-30)

(b) judicial exemption of an agency based upon its successful delay of statutory review while construction continued, and

(c) judicially implied amendment based upon some notion of "supervision" by appropriations committees outside of statutory amendment procedures.

Since the defendants' supplemental arguments add nothing substantive to prior arguments, plaintiffs respectfully rest on their briefs previously filed, and urge that defendants' motion and materials not operate so as to delay the panel's early consideration of this case.

Plaintiffs would have preferred to have had Congressional review of this matter two and a half years ago. At this long-delayed stage of proceedings there appears to be no reason for granting defendants a further delay. Plaintiffs respectfully note that under the law as written and as interpreted by the Courts, an injunction against further construction and closure of the dam segment of the project should issue until Congress considers this complex issue and resolves it in the proper political form.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I certify that the foregoing brief was served on defendants-appellees by mailing two copies to defendants' counsel, Mr. Thomas A. Pederson, at his place of business, Division of Law, E-10, B-41, Tennessee Valley Authority, 400 Commerce Ave., Knoxville, Tennessee 37902.

Zygmunt J. B. Platter
Attorney for Plaintiffs - Appellants

November 18, 1976

United States Court of Appeals for the Sixth Circuit

No. 76-2116

HIRAM G. HILL, Jr., ZYGMUNT J. B. PLATTER, DONALD S. COHEN, THE AUDUBON COUNCIL OF TENNESSEE, INC., AND THE ASSOCIATION OF SOUTHEASTERN BIOLOGISTS, PLAINTIFFS-APPELLANTS

v.

TENNESSEE VALLEY AUTHORITY, DEFENDANTS-APPELLEES

APPEAL FROM THE UNITED STATES DISTRICT COURT FOR THE EASTERN DISTRICT, NORTHERN DIVISION OF TENNESSEE

Decided and Filed January 31, 1977

Before Celebrezze, Peck and McCree, Circuit Judges.

Celebrezze, J., delivered the opinion of the Court, in which Peck, J., joined. McCree, J., (p. 19) filed a concurring opinion.

Celebrezze, Circuit Judge. For the third time in five years we are called upon to resolve a dispute between environmentalists and the Tennessee Valley Authority (TVA) over the legality of the Tellico Dam and Reservoir project. The issue on appeal in this instance is the propriety of the district court's denial of Appellants' request for a permanent injunction to prevent TVA from imminently closing the Tellico Dam. Appellants allege that the resulting reservoir will flood the only recognized habitat of the snail darter, a rare protected species of river-dwelling fish, thereby jeopardizing its continued survival, in violation of §§ 7 and 9 of the Endangered Species Act of 1973.[1] 16 U.S.C. §1531 *et seq.*

Tellico was initially proposed by TVA and ultimately approved by Congress in October, 1966, as a multipurpose, water

[1] 16 U.S.C. §§ 1536 and 1538(a)(1)(B) respectively.

resource and regional economic development project. It was primarily intended to benefit Blount, Loudon and Monroe Counties, Tennessee, "an area characterized by under-utilization of human resources and outmigration of young people." *Hearings before a Subcomm. of the House Comm. on Appropriations*, 94th Cong., 2d Sess., at 261.

The engineering focus of the proposal was a concrete and earthfill dam to be situated near the mouth of the Little Tennessee River. This impoundment would create a navigable reservoir thirty-three miles long covering an area of 16,000 acres, including 2,100 acres of the existing river bed. Proponents of the project claimed that it would stimulate new shoreline industrial development, increase recreational opportunities and tourism, and augment existing hydro-electric power generating and flood control capabilities.[3] Congress agreed and in 1966 authorized initial Tellico project appropriations. Construction commenced in March, 1967. Closure of the dam is now scheduled to be completed in January, 1977.

For the present, the river remains free-flowing and Appellants seek to preserve it indefinitely in its present state as a natural resource.[4] TVA counters that it is the express will of the Congress that Tellico "be completed as promptly as possible in the public interest." S. REP. No. 94–960, 94th Cong., 2d Sess. 96 (1976). TVA believes that such an unequivocal expression of congressional intent neutralizes any violation of the Endangered Species Act which may be involved in the impoundment of the river. We are therefore asked to balance the survivial of a living species against the completion of a public works project which is more than 80% completed and represents a federal investment of almost ninety million dollars.

In 1971 and again in 1973, environmentalists and affected landowners petitioned the federal court seeking to forestall construction of the Tellico Dam on the ground that TVA had failed to comply with requirements of the National Environmental

[3] The Tellico Dam will have no electrical generators, but will contribute hydrostatic capacity to the existing TVA system via an 850 foot canal connecting the Tellico Reservoir with the Fort Loudon Reservoir.

[4] *Environmental Defense Fund* v. *Tennessee Valley Authority*, 339 F. Supp. 806, 809 (E.D. Tenn. 1972), summarizes in considerable detail the scenic, historical, archeological and recreational attributes of the Little Tennessee River in its pristine state.

Policy Act of 1969 (NEPA), 42 U.S.C. 4321 *et seq.* They were successful in obtaining a preliminary injuction which halted project implementation for more than a year and a half,[5] affirmed by this Court in *Environmental Defense Fund* v. *Tennessee Valley Authority*, 468 F. 2d 1164 (6th Cir. 1972), but the district court ultimately concluded that TVA's revised Tellico environmental impact statement fully complied with NEPA,[6] and we affirmed. *Environmental Defense Fund* v. *Tennessee Valley Authority*, 492 F. 2d 466 (6th Cir. 1974).

In August, 1973, a University of Tennessee ichthyologist discovered a unique and theretofore unknown species of fish, the snail darter (*Percina Imostoma tanasi*), thriving in the Little Tennessee River. This three-inch, tannish, bottom-dwelling member of the perch family, was found to feed upon fresh water snails (from whence its name was derived). In addition to providing the snail darter with a bountiful supply of its primary food, the river also maintained the oxygen levels required to sustain the species through aerating action of its rapidly flowing currents. The range of the snail darter's habitat encompassed seventeen miles of the river's course scheduled to be subsumed within the Tellico Reservoir. A search of other rivers of comparable ecology confirmed that the Little Tennessee was virtually the exclusive preserve of the world's snail darter population (recently estimated to number between 10,000 and 15,000 fish).[8]

On December 28, 1973, four months after the discovery of the snail darter, Congress passed the Endangered Species Act, 16 U.S.C. § 1531 *et seq.* One of the Act's purposes was "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved * * *" 16 U.S.C. § 1531(b). Section 1533 of the Act empowered the Secretary of the Interior to compile and maintain separate official lists of threatened and endangered

[5] *Id.*

[6] *Environmental Defense Fund* v. *Tennessee Valley Authority*, 371 F. Supp. 1004 (E.D. Tenn. 1973).

[8] TVA searched unsuccessfully for the species in 60 to 70 rivers in Alabama and Tennessee. Less than 70 specimens have been sighted downstream from the location of the Tellico Dam itself and none have been found above river mile 18 of the Little Tennessee.

species.[7] Section 1536 unequivocally commits all federal agencies to:

> utilize their authorities in furtherance of the purposes of [the Act] by * * * taking such action necessary to *insure* that actions authorized, funded, or carried out by them do not jeopardize the continued existence of such endangered species and threatened species or result in the destruction or modification of habitat of such species which is determined by the Secretary * * * to be critical. (emphasis added).

Section 1540(g)(1)(A) authorizes suits by private citizens seeking "to enjoin any person, including the United States and any other governmental instrumentality or agency * * * who is alleged to be in violation of any provision of [the Act] or regulation issued under the authority thereof."

In January, 1975, several persons, including Appellants Hill and Plater, petitioned the Secretary of the Interior to add the snail darter to the endangered species list. Section 1533 (c)(2). As part of the rule making procedure,[8] TVA was invited by the Department to comment. On November 10, 1975, over TVA's objections, the snail darter was designated as an endangered species primarily because of the threat posed by the Tellico project to destroy the species and its only known habitat.[9] 50 C.F.R. § 17.11(i)(1975); 40 Fed. Reg. 47505–47506 (1975). As required by § 1540(g)(2)(A)(i), Appellants notified both the Department of the Interior and TVA on October 20, 1975, that continued preparations to impound the Little Tennessee River would violate § 1536.

On February 28, 1976, Appellants brought suit in United States District Court for the Eastern District of Tennessee seeking to permanently enjoin completion of the dam. In April, the United States Fish and Wildlife Service, acting pursuant to

[7] The snail darter is *not* one of the species over which the Secretary of Commerce has "program responsibilities" pursuant to Reorganization Plan Number 4 of 1970. 16 U.S.C. § 1533(2).

[8] 16 U.S.C. § 1533(b) and the rule making provisions of the Administrative Procedure Act, 5 U.S.C. § 553, collectively define the procedures which the Secretary of the Interior must follow in maintaining the lists of threatened and endangered species. *See* 16 U.S.C. § 1533(f)(1).

[9] *See* 16 U.S.C. § 1533(a)(1) [factors (1) and (5)].

rule making authority originally granted to the Secretary of the Interior in § 1536, designated river miles .5 to 17 as the "critical habitat" of the snail darter, 41 Fed. Reg. 13926–13928 (1976); *see* 50 C.F.R. § 17.81 (1976).[10] On April 29th and 30th a trial was held during which evidence was presented pertaining to whether the scheduled inundation of the Little Tennessee would jeopardize the species' continued survival. The Court also entertained argument on whether permanent injunctive relief would be appropriate to enforce compliance with the Act if the evidence made out a prima facie violation of §§ 1536 or 1538(a)(1)(B). In a memorandum opinion and Order dated May 25, 1976,[11] the court concluded:

> * * * the preponderance of the evidence demonstrates that closure of the Tellico Dam in January 1977 and the consequent creation of the Tellico Reservoir will result in the adverse modification, if not complete destruction, of the snail darter's critical habitat.[12]

However, the Court denied Appellants' prayer for a permanent injunction and dismissed the action based upon an analysis of the equities which it found to be controlling.

Appellants claim that the Court's refusal to impose an injunction was legally inconsistent with its finding of a blatant statutory violation. They contend that the Court clearly abused its discretion in light of express congressional recognition, in § 1540(g)(1)(A), of the appropriateness of injunctive relief to redress violations of the Act or of rules promulgated thereunder. They find no support within the language of the Act or its legislative history for exempting on-going projects from compliance, and therefore ask us to enforce the letter of the law by summarily halting Tellico Dam construction. Appellants argue that only Congress and the Secretary of the Interior have the power to relieve TVA of its obligations under the Act through enabling legislation or remedial rule making respectively. Our abiding interest in preserving the functional independence of the coordinate

[10] "Critical habitat" is administratively defined by the Department of the Interior at 40 Fed. Reg. 17764–17765 (1975).

[11] *Hill et al. v. Tennessee Valley Authority*, Civil No. 3–76–48 (E.D. Tenn., May 25, 1976) [hereinafter cited as *Memorandum Opinion*].

[12] *Id* at 7–8.

branches of government, as ordained by the constitutional separation of their enumerated powers, compels us to reverse the District Court and grant the relief requested. *Wilderness Society* v. *Morton*, 479 F. 2d 842, 892–893 (D.C. Cir. 1973).

Although this legal controversy may well enjoy a modicum of notoriety because it appears to pit the survival of an obscure fish against completion of a $100 million reservoir, "the principles of law controlling [the case] are neither complex nor revolutionary." *Wilderness Society, supra*, at 891. Only three questions need be addressed:

> (1) Does Tellico Dam completion violate the Endangered Species Act?
>
> (2) Assuming a violation, are there adequate grounds for exempting Tellico from compliance?
>
> (3) If no exemption is justified, is injunction the proper remedy to effectuate the purposes of the Act?

We are satisfied that TVA's continued preparations to dam the Little Tennessee violate § 1536 of the Endangered Species Act. The District Court concluded from the evidence at trial that "it is highly probable that closure of the Tellico Dam and the consequent impoundment of the river behind it will jeopardize the continued existence of the snail darter." TVA conceded that a significant portion of the designated "critical habitat" of the snail darter would be altered by conversion of the free-flowing river to a reservoir. The record supports Appellants' claim that the intrinsic environmental differences between river and reservoir bottom will inexorably destroy large numbers of snail darter eggs as well as inhibit the specie's spawning instinct. Therefore, the District Court properly determined that, because so few specimens have been found outside the critical habitat area, "the known population of snail darters will be significantly reduced if not completely extirpated • • •" by the drastic physical transformations to be accomplished by closure of the dam.

For reasons not obvious from the record, the District Court's opinion does not explicitly conclude that its factual findings constitute a prima facie violation of § 1536.[13] We rectify this

[13] Because the district court concluded that closure of the Tellico Dam would violate Section 7, it did not consider whether the same state of facts also constituted a violation of Section 9 of the Act. 16 U.S.C. § 1538(a)(1)(B). *See* note 14 *infra*. We need not reach this issue because it does not alter the outcome of this appeal.

defect now by construing footnote 1 of the memorandum opinion as conclusive evidence that this was the intent of the Court.[14] In determining whether TVA's creation of the reservoir contravenes this section, the District Court appears to have relied upon an administrative definition of violative conduct by the Secretary of the Interior. Under this standard, an action affecting a designated critical habitat is deemed to be an offense if it,

> • • • might be expected to result in a reduction in the number or distribution of [the] species of sufficient magnitude to place the species in further jeopardy, or restrict the potential and reasonable expansion or recovery of that species.

40 Fed. Reg. 17764–17765 (1975).

Although we are not compelled to follow agency constructions of a regulatory measure, courts have traditionally shown "great deference to the interpretation given the statute by the officers or agency charged with its administration." *Udall* v. *Tallman*, 308 U.S. 1, 16 (1964). Section 1536 conveys a pivotal role to the Secretary of the Interior to achieve voluntary compliance with the policy objectives of the Act by federal agencies and departments whose programs may alter critical ecosystems. The Secretary is not empowered to veto the final actions of such agencies, even when he is convinced, after the requisite consultation has ensued, that they violate the Act, *National Wildlife Federation* v. *Coleman*, 529 F. 2d 359, 371 (5th Cir. 1976); *accord*, *Sierra Club* v. *Froehlke*, 534 F. 2d 1289, 1303 (8th Cir. 1976). However, his compliance standards may properly influence final judicial review of such actions, particularly as to technical matters committed by statute to his special expertise.

We find the Secretary's interpretation of § 1536 to be both reasonable and consistent with our reading of the Act's legisla-

[14] "In light of this conclusion [that 'closure of the Tellico Dam and consequent creation of the Tellico reservoir will jeopardize the continued existence of the snail darter or destroy or modify the critical habitat thereof'], we do not deem it necessary to decide whether defendant's activities constitute an illegal 'taking' of the species in violation of Section 9 of the Act." (citation omitted) Memorandum Opinion at 4 n. 1.

tive history.[15] In the absence of conflicting judicial precedents, we see positive benefit to be gained by impressing his criteria with a judicial imprimatur. This will expedite the adjudication of future cases as well as assist the Secretary in achieving a uniform federal conservation posture with minimal reliance upon the courts. Applying this test to the District Court's findings of fact, we conclude that TVA's Tellico project operations violate § 1536.[16]

TVA concedes the existence of a predictable causal nexus between the impoundment of the Little Tennessee and the ultimate depletion of the snail darter population. This admission alone suffices to bring the affirmative action requirement of § 1536 into play. On appeal, however, TVA argues that closure of the Tellico Dam, as the last stage of a ten year project, falls outside the legitimate perview of the Act if it is rationally construed. TVA cautions that it would lead to absurb results if we were to include the terminal phases of on-going projects among the "actions" of departments and agencies to be scrutinized for compliance. We find this familiar line of reasoning unpersuasive and believe that the District Court erred in adopting it. *See Environmental Defense Fund* v. *Tennessee Valley Authority*, 468 F. 2d at 1177.

To countenance so restrictive a construction of § 1536, in the absence of positive reinforcement from the Act's legislative history, would, in our view, be inimical to achieving its objectives. We choose instead to give the term "actions" its plain meaning in the belief that this will best effectuate the will of the Congress.

The complexity of the ecological sciences suggests that the detrimental impact of a project upon an endangered species may not always be clearly perceived before construction is well underway. In effect, such was the case here. For Congress or the Secretary of the Interior to be able to make meaningful decisions in furtherance of the purposes of the Act, the opportunity to choose must be preserved. Once a living species has been eradicated, discretion losses its significance. Where a project is on-

[15] *See* 2 *U.S. Code Cong. & Admin. News* 1973, 93rd Cong., 1st Sess., at 2988–3008.

[16] The Department of the Interior reached the same conclusion. *See* letter by Assistant Secretary Reed. Memorandum Opinion at 10.

going and substantial resources have already been expended, the conflict between national incentives to conserve living things and the pragmatic momentum to complete the project on schedule is most incisive. Therefore, were we to deem the extent of project completion relevant in determining the coverage of the Act, we would effectively defeat responsible review in those cases in which the alternatives are most sharply drawn and the required analysis most complex. This expedient strategy would frustrate effective enforcement of the Act and hinder efforts to prevent the wanton destruction of vulnerable species.

Current project status cannot be translated into a workable standard of judicial review. Whether a dam is 50% or 90% completed is irrelevant in calculating the social and scientific costs attributable to the disappearance of a unique form of life. Courts are ill-equipped to calculate how many dollars must be invested before the value of a dam exceeds that of the endangered species. Our responsibility under § 1540(g)(1)(A) is merely to preserve the status quo where endangered species are threatened, thereby guaranteeing the legislative or executive branches sufficient opportunity to grapple with the alternatives.

The importance of this role is admirably demonstrated by a hypothetical situation postulated by the district court:

> If Plaintiff's argument were taken to its logical extreme, the Act would require a court to halt impoundment of water behind a fully completed dam if an endangered species were discovered in the river on the day before such impoundment was scheduled to take place.[17]

The district court dismissed this proposition out of hand as unreasonable and inconsistent with the intent of Congress. We disagree. Conscientious enforcement of the Act requires that it be taken to its logical extreme.

In *National Wildlife Federation* v. *Coleman*, 529 F. 2d 359 (5th Cir.) *cert. denied*, 45 LW 3397 (Nov. 30, 1976), for example, the welfare of the Mississippi Sandhill Crane was threatened by future construction of a 5.7 mile segment of Interstate Highway I–10 scheduled to traverse the Crane's designated critical habitat. Only 40 Sandhill Cranes are known to exist. Based upon the weight of the evidence, the Fifth Circuit reversed the district court's denial of injunctive relief

[17] Memorandum Opinion at 23–24.

and remanded the case with instructions that an injunction issue halting activities which might "jeopardize the continued existence of the Mississippi Sandhill Crane or destroy or modify critical habitat" in violation of § 1536. *Id.* at 375. The injunction is to remain in effect until the Secretary of the Interior determines that modifications to the project will bring it into compliance with the Act.

In assessing the potential adverse impact of the highway upon the Crane's habitat, the Fifth Circuit concluded that indirect effects such as accompanying private development were relevant factors. This broad reading of the protection afforded by § 1536 is consonant with our view. If injunctive relief is appropriate where extirpation of the species is not a predictable consequence of the violative activity, as in the Sandhill Crane case, it is unquestionably mandated here where eradication is a realistic possibility.

We reject as inapposite all but one of the NEPA cases cited by TVA in support of its on-going project exemption theory. In *Environmental Defense Fund* v. *Tennessee Valley Authority*, Judge McCree, speaking for this Court, held that, even if it were conceded that Tellico was a unified construction effort, a single "ball of wax" whose contours were known and approved by Congress prior to NEPA's effective date, Tellico was not excused from full compliance with environmental impact statement requirements for on-going activities. 468 F. 2d at 1172. We find Judge McCree's expression of the congressional intent behind NEPA to be an accurate reflection of the pervading spirit of the Endangered Species Act:

> • • • Congress envisaged on-going agency attempts to minimize environmental harm caused by the implementation of agency programs. This could encompass not only *constant reevaluations of projects already begun* to determine whether alterations can be made in existing features or whether there are alternatives to proceeding with projects as initially planned, but also the consideration of the environmental impact of all proposed agency action. *Id.* at 1176 (emphasis added).

All of the other NEPA cases which waive compliance based upon advanced project construction, *see e.g.*, *Ragland* v. *Mueller*, 460 F. 2d 1196, 1198 (5th Cir. 1972); *Environmental Defense Fund, Inc.* v. *Corps of Engineers of the United States Army*, 470 F. 2d 289, 301 (8th Cir. 1972), are readily distinguished by one fact which they all share: any judicial error in a NEPA case is subject to later review and remedial reversal before permanent damage is done to the environment. The same cannot be said for an erroneously granted exemption from the Endangered Species Act. If we were to err on the side of permissiveness here, and allow TVA to complete and close the dam as scheduled, the most eloquent argument would be of little consequence to an extinct species.

We conclude that the on-going nature of a project does not preclude enforcement of § 1536. *National Wildlife Federation* v. *Coleman, supra; Sierra Club* v. *Froehlke*, 534 F. 2d 1289, 1305 (8th Cir. 1976).[18] TVA has failed to take the necessary steps to insure that the impoundment of the Little Tennessee River will not jeopardize the survival of the snail darter or modify its habitat. We, therefore, find that continued work, directed toward impoundment, violates § 1536 of the Act. *See National Wildlife Federation* v. *Coleman, supra;* at 373.

We cannot condone non-compliance on the theory propounded by TVA that congressional approval of Tellico appropriations, upon full disclosure of the plight of the snail darter, constitutes legislative acquiescence in or express ratification of TVA's *laissez faire* interpretation of the Act. *See Hearings on Public Works for Water and Power Development Appropriation Bill, 1977, before a Subcomm. of the House Comm. on Appropriations*, 94th Cong., 2d Sess. at 260–262 (1976). Advisory opinions by Congress concerning the "proper" application of an *existing* statute cannot influence our review because they lack the force of law. To credit them would be tantamount to permitting the legislature to invade a province reserved to the courts by Aritcle III of the constitution. The meaning and spirit of the Act are clear on its face. We need not refer to legislative history to rationalize our independent assessment of its impact. *See e.g., United States* v. *Oregon*, 366 U.S.

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[18] In *Sierra Club* v. *Froehlke* [the "Indiana Bat" case] the 8th Circuit implicitly conceded the applicability of the Act to an on-going dam construction project, but affirmed the district court's finding that the evidence was insufficient to make out a substantive violation of Sections 7 or 9.

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643, 648 (1961); *United States* v. *Jones*, No. 76-1189 at 9 (6th Cir. Sept. 30, 1976). As the District of Columbia Circuit has said in a similar context:

> [I]t is well settled that repeal by implication is disfavored, and the doctrine applies with full vigor when, as here, the subsequent legislation is an appropriations measure, and when the prior Act is to continue in its general applicabilty, as construed by the courts, but the claim is made that it is to be subject to a particularized legislative exception. *Committee For Nuclear Responsibility, Inc.* v. *Seaborg*, 463 F. 2d 783, 785 (D.C. Cir. 1971) (footnotes omitted).

If the separation of powers doctrine is to retain its vitality, Congress must be free to appropriate funds for public works projects with the expectation that resulting executive action will pass judicial muster. *See Environmental Defense Fund, Inc.*, v. *Froehlke*, 473 F. 2d 346, 455 (8th Cir. 1972). Conversely, courts must defend their prerogative to apply the law as they find it "to require the Executive to abide by the limitations prescribed by the legislature." *Wilderness Society* v. *Morton, supra* at 892. Judge Skelly Wright, in commenting upon the imperative nature of this division of labor, has observed that:

> The scrupulous vindication of that principle of law, implicit in our form of government . . . and its basic checks and balances looms more important in the abiding public interest than the embarkation on any immediate or specific project, however desirable in and of itself, in contravention of that principle. *Id.*

Congress recognized the danger of bypassing plenary consideration of proposed modification to existing laws by adding amendments to appropriations bills. As the Eighth Circuit notes in *Environmental Defense Fund* v. *Froehlke*, House Rule XXI is specific in providing that "no appropriation shall be reported in any general appropriation bill, • • • Nor shall any provision in any such bill or amendment thereto *changing existing law* be in order, • • •" 473 F. 2d 346, 354 (emphasis added).

TVA directs us to our own decision in *United States ex rel. TVA* v. *Two Tracts of Land*, 456 F. 2d 264 (6th Cir. 1972), as evidence of our reliance upon congressional spending decisions as indicia of legislative approval of the application of existing laws by the executive branch. This citaton bespeaks a misapprehension of the significance of that case. It also ignores the relevance of our rejection in a more recent decision of TVA's argument that sustained congressional appropriations excused Tellico from full compliance with NEPA. *Environmental Defense Fund* v. *Tennessee Valley Authority*, 468 F. 2d at 1182. In *Two Tracks* we viewed the continued financing of TVA's on-going land acquisition activities as implied ratification by Congress of a system of rules and regulations promulgated by TVA to give effect to enabling legislation which the Authority was charged with administering.[19] We found nothing in TVA's procedure which conflicted with reasonable attainment of that legislation's fundamental goals. Where a statute or executive order provides but the bare bones of a project authorization, leaving the administrative "flesh" to be added by an implementing authority, courts may properly interpret sustained congressional appropriations as some evidence that the evolving form of the project effectuates the original legislative intent.

In the instant case, however, TVA is neither charged with administering the Act nor is its conduct compatible with the measure's conservationist aims. In spite of this, TVA asks us to bow to the will of Congress as it may be construed from pronouncements of two congressional appropriations subcommittees.[20] As a court we cannot countenance such patent usurpation of legislative authority. Nor will we expurgate an important federal policy statute designed to foreclose all activities antithetic to the preservation of the "esthetic, ecological, educational, historical, recreational, and scientific value to the Nation and its people" of vulnerable species of fish, wildlife and plants. 16 U.S.C. § 1531(3); *see United States* v. *Jones, supra*, at 21. We are fully in accord with the 4th Circuit's view, in *West Virginia Division of Izaak Walton League of America, Inc.* v. *Butz*, that:

> Economic exigencies • • • do not grant courts a license to rewrite a statute no matter how desirable the purpose

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[19] The land was acquired for the Land Between the Lakes Project authorized by the President under authority conveyed by 16 U.S.C. § 831u (1964). The authority to condemn properties was vested in TVA by other subsections of that enabling legislation. 456 F. 2d at 267.

[20] *See e.g.*, Rep. 94-960, 94th Cong., 2d Sess. 96 (1976).

> or result might be • • • [T]he appropriate forum to resolve this complex and controversial issue is not the court's but the congress. 522 F. 2d 945, 955 (4th Cir. 1976).

With no cause to exempt the Tellico project from strict compliance with the Act, we find that the District Court abused its discretion in refusing to permanently enjoin all further actions by TVA which may detrimentally alter the critical habitat of the snail darter. We cannot accept TVA's contention that, even if Tellico completion is technically in violation of the law, halting further construction pending intervention by Congress or additional rule making by the Secretary of the Interior constitutes an inequitable remedy.

TVA claims to have done everything possible to save the snail darter, short of abandoning work on the dam. That alternative is deemed by TVA to be innately unreasonable. We do not agree. It is conceivable that the welfare of an endangered species may weigh more heavily upon the public conscience, as expressed by the final will of Congress, than the writeoff of those millions of dollars already expended for Tellico in excess of its present salvagable value.

We recognize that TVA has completed an experimental transplant of some 700 snail darter specimens from the Little Tennessee to the Hiwassee River which is of similar physical character. While we share the hope that conclusive evidence, not yet available, will confirm that the displaced population is thriving and reproducing, even if that evidence were properly before us, it would not alter our decision to enjoin further Tellico Dam construction. It is not the courts but the Secretary of the Interior who bears the responsibility for maintaining the endangered species list and the designating the critical habitats of listed species. The fact that both of these determinations are accomplished by rule-making rather than by adjudication confirms the public importance of the issues at stake. Nowhere in the Act are courts authorized to override the Secretary by arbitrarily "reading" species out of the endangered list or by redefining the boundaries of existing critical habitats on a case-by-case basis. The standard of judicial review of such rule-making, defined in Section 706 of the Administrative Procedures Act, as interpreted in *Citizens to Preserve Overton Park, Inc.* v. *Volpe*, 401 U.S. 402, 414 (1971), is restrictive.[21] It does not permit substitution of judgment.

TVA will have to petition the Secretary if it wishes to attempt to blunt the impact of the Act by curative rule-making. So long as the snail darter remains on the endangered list and its critical habitat comprises miles .5 through 17 of the Little Tennessee River, we have no recourse but to enjoin creation of the reservoir.

Although we must reverse the district court's decision, we are sympathetic to its analysis of the equitable factors present here which would normally militate against granting injunctive relief. TVA has not acted in bad faith. Its efforts to preserve the snail darter appear to be reasonable.

As we have already demonstrated, only Congress or the Secretary of the Interior can properly exempt Tellico from compliance with the Act. The separation of powers doctrine is too fundamental a thread in our constitutional fabric for us to be tempted to preempt Congressional action in the name of equity or expediency.

The district court abused its discretion when it refused to enjoin a clear violation of federal law. As the Supreme Court has said in *Hecht* v. *Bowles*, 321 U.S. 321, 331 (1944); where the national policy objectives of a statute have been frustrated, "• • • the standards of the public interest, not the requirements of private litigation, measure the propriety and need for injunctive relief • • •" *Accord, Securities & Exchange Commission* v. *Advance Growth Capital Corp.*, 470 F. 2d 40, 53 (7th Cir. 1972).

Therefore, we reverse the district court's order of dismissal and remand the cause with instructions that a permanent injunction issue halting all activities incident to the Tellico Project which may destroy or modify the critical habitat of the snail darter. This injunction shall remain in effect until Congress, by appropriate legislation, exempts Tellico from compliance with the Act, or the snail darter has been deleted from the list of endangered species or its critical habitat materially redefined.

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[21] For an apt analysis of the appropriate scope of review of discretionary agency action, *see Sierra Club* v. *Froehlke*, *supra*, at 1304–1305. Here we have applied the *Overton Park* standard to find that, although TVA has acted within the scope of its authority, its decision to complete the Tellico Dam at the expense of the snail darter is "not in accordance with law." *Id.*

Reversed and remanded.

McCree, Circuit Judge (Concurring). I concur in the judgment of the court. The district court found that the completion of the Tellico dam would "jeopardize the continued existence of the snail darter," and, therefore, we must conclude that completion of the project would violate the Endangered Species Act. The Tellico dam project is not exempt from the provisions of the Act, either because it was begun before the Act was passed and before the snail darter was listed as an endangered species, or because a Congressional committee was aware of the fact that the snail darter would be threatened by completion of the dam when the Congress approved additional appropriations. I agree that the case should be remanded with instructions to issue an injunction forbidding project activity that would threaten the existence of the snail darter.

United States Court of Appeals for the Sixth Circuit

No. 76-2116

Hiram G. Hill, Jr., Zygmunt J. B. Plater, Donald S. Cohen, The Audubon Council of Tennessee, Inc., and The Association of Southeastern Biologists, plaintiffs-appellants

v.

Tennessee Valley Authority, defendants-appellees

Before Celebrezze, Peck and McCree, Circuit Judges.

Judgment

APPEAL from the United States District Court for the Eastern District of Tennessee.

THIS CAUSE came on to be heard on the record from the United States District Court for the Eastern District of Tennessee and was argued by counsel.

ON CONSIDERATION WHEREOF, It is now here ordered and adjudged by this Court that the judgment of the said District Court in this cause be and the same is hereby reversed and the cause remanded for further proceedings.

It is further ordered that Plaintiffs-Appellants recover from Defendants-Appellees the costs on appeal, as itemized below, and that execution therefor issue out of said District Court if necessary.

Entered by order of the court.

John P. Hehm,
Clerk.

A True Copy.
Attest:

Darlene Koenig,
Deputy Clerk.

Issued as Mandate: March 3, 1977.
Costs: To be recovered by appellants.

Filing fee	$50.00
Printing	$.....
Total	$.....

United States District Court for the Eastern District of Tennessee Northern Division

Filed February 24, 1977

[No. 3-76-48]

HIRAM G. HILL, Jr., ZYGMUNT J. B. PLATEK, DONALD S. COHEN, THE AUDUBON COUNCIL OF TENNESSEE, INC., AND THE ASSOCIATION OF SOUTHEASTERN BIOLOGISTS, PLAINTIFFS

v.

TENNESSEE VALLEY AUTHORITY, DEFENDANT

Order

Upon application of the plaintiffs, it appearing to the Court that the Sixth Circuit Court of Appeals, on January 31, 1977, filed an opinion in the above action with instructions "that a permanent injunction issue halting all activities incident to the Tellico Project which may destroy or modify the critical habitat of the snail darter," and the parties having agreed upon the form of this order,

It is ORDERED by the Court Pursuant to the Order of the Sixth Circuit that defendant Tennessee Valley Authority be, and it hereby is, permanently enjoined from the following:

1. Closing the dam and consequently creating the reservoir.

2. Engaging in any further work or activity on the dam structure or the Tellico project which may destroy or modify the critical habitat of the snail darter. Defendant is permitted to do the following:

A. *Dam Area*

(1) Provide continuous cleaning of debris from sluices.

(2) Condition canal plug for long-term service.

(3) Stabilize canal slopes with grassing.

(4) Complete manholes for protection on dam instrumentation.

(5) Periodically test and operate spillway gates machinery.

(6) Set up barricades and signs, as appropriate, for public safety.

(7) Seeding of upstream slope of dam and reseeding downstream slopes.

(8) Seed saddle dam areas.

(9) Complete spillway gates and machinery painting.

(10) Complete landscaping and site improvements in dam reservation area.

B. *Roads and Reservoir*

(1) Complete cleanup and burning, and other disposition of cut timber, debris and trash in reservoir basin, provided such is done in a manner so as to minimize siltation and adverse effects upon the Little Tennessee River, the snail darter, or its habitat.

(2) Complete work and open Tellico canal bridge to traffic (permanent canal plug and temporary canal plug shall both remain).

(3) Protect all highway embankments with rip-rap and grass.

(4) Complete all highway guardrails and signs.

(5) Complete all road projects, provided the work is performed so as to minimize siltation and adverse effects upon the Little Tennessee River, the snail darter, or its habitat.

(6) Repair and/or repave segments of original roadways or highways where traffic must continue until new roads are opened.

(7) Provide maintenance to keep detour roads and partially completed roads in use.

(8) Provide for erosion control where necessary in reservoir to prevent siltation.

(9) Erect warning signs and/or barricades to protect public in case low-level reservoir roads are inadvertently flooded.

(10) Rebuild Highway 72 at Clear Prong Creek and project 1101 for continued use.

(11) Continue work on Tellico Parkway and access road with bridge below the dam.

(12) Remove abandoned bridges and culverts where removal is necessary for public safety, provided such is done in a manner to minimize siltation and adverse effects upon the Little Tennessee River, the snail darter, or its habitat.

C. *Other Activities*

(1) Modify TASS Water Treatment Plant temporary intake for long-term use.

(2) Complete protection at all historic locations and complete restoration of Fort Loudon, Blockhouse, and Chota.

(3) Complete new electrical substation for Loudon Utilities near Vonore.

Approved for entry.

ROBERT L. TAYLOR, *Judge.*

Approved for entry:

W. P. BOONE DOUGHERTY,
Attorney for all of the Plaintiffs, Hiram G. Hill, Jr., Zygmunt J. B. Plater, Donald S. Cohen, The Audubon Council of Tennessee, Inc., and The Association of Southeastern Biologists.

HERBERT S. SANGER, Jr.,
General Counsel, Tennessee Valley Authority, Knoxville, Tennessee, Attorney for Defendant.

TRANSCRIPT

[1–9] Mr. DOUGHERTY: Exhibit 31 is a photograph of a darter which has already been seen by the defendant and marked by the Clerk.

[Exhibit No. 31 was filed.]

Mr. DOUGHERTY. Your Honor, I would like to offer at this time Mr. Plater, one of the plaintiffs, very briefly, and then we can get to the meat of the coconut.

The COURT. All right.

ZYGMUNT J. B. PLATER, a plaintiff, called as a witness by and in his own behalf, after having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

By MR. DOUGHERTY:

Q. Please state your full name for the Court?

A. My name is Zygmunt Plater.

And you reside in Knox County, Tennessee?

A. I do.

Q. You are one of the plaintiffs in this case?

A. I am.

Q. You are involved in this action on your own behalf and do not represent the University of Tennessee nor the College of Law?

[1–10] A. That is correct.

Q. But you are a professor of law at the University of Tennessee College of Law?

A. Yes, I am.

Q. In connection with the involvement that you have in this particular action, on April 22, 1976 did you go to Washington, D.C. and deliver to Mr. Nathaniel Reed, Secretary for Fish and Wildlife, Department of Interior, a letter asking him for certain information?

A. Yes, I did.

Q. I show you a copy of that letter which has been heretofore marked by the Clerk and ask you if that is the letter, a copy of it, which you delivered to Mr. Reed?

A. Yes, this is a copy of the letter I delivered to Secretary Reed.

Q. April 22, 1976, Mr. Plater?

A. Yes.

Mr. DOUGHERTY. May we introduce that letter as Exhibit No. 32?

The COURT. Yes.

[Exhibit No. 32 was filed.]

By Mr. DOUGHERTY:

Q. In that letter, Mr. Plater, you were essentially asking the Department of Interior for certain comments in connection with their involvement in this matter as far [1–11] as the endangered species and the snail darter?

A. Yes, sir, I was.

Mr. DOUGHERTY. And I think, Your Honor, just for purposes of simplicity we will refer to the fish involved in this matter as the snail darter, but I think for the record it is technically known as Percina imostoma tanasi, and there may be some reference to that, but we will try and refer to it as the snail darter.

The COURT. That will be better, I think.

By Mr. DOUGHERTY:

Q. Mr. James D. Williams is here prepared to testify as a witness, is he not?

A. Yes, he is.

Q. And he is an ichthyologist with the Department of the Interior, the Office of Endangered Species?

A. Yes, he is.

Q. And yesterday afternoon, April 28, 1976, did he deliver to you Mr. Reed, and specifically hand deliver that letter to you, a response to your letter of April 22, 1976?

A. Yes, sir. He delivered to me a certified copy, certified by the Department of Interior.

Q. I show you a document, Mr. Plater, that has not been marked by the Clerk as we only received it [1–12] yesterday afternoon, and I understand, may it please the Court, that TVA the defendant received a copy by telefax, frankly, before we did, so they have a copy of it.

Mr. DOUGHERTY. May we offer that as Exhibit No. 33?

Mr. PEDERSEN. Your Honor, we would want to object to that letter. It was received here on the eve of trial and had no opportunity whatever to depose the author of the letter. We haven't had a chance whatever to make any inquiry with respect to this matter.

The COURT. It will be received subject to your objection.

Mr. PEDERSEN. Thank you.

[Exhibit No. 33 was filed.]

Mr. DOUGHERTY. I might add, Your Honor, that Mr. Williams is with the Department of the Interior and is prepared to testify that he hand delivered it and saw it actually executed in his office and involved somewhat in its preparation.

By Mr. DOUGHERTY:

Q. You have read the letter, have you not, Mr. Plater?

A. Yes, I have.

Q. Would you mind giving it to the Marshal so he [1–13] can give to His Honor.

A. [Witness complies with request of counsel.]

The COURT. You may proceed. Go right ahead.

Mr. DOUGHERTY. Other than the two documents, the April 22nd letter written by Mr. Plater and receipt of the letter from the Department of the Interior signed by Mr. Nathaniel Reed, which Your Honor has in front of you, which I understand is marked Exhibit No. 33, that is the only series of items that I would ask to introduce through Mr. Plater and I turn him over for cross-examination at this point.

Mr. PEDERSEN. No questions, Your Honor.

Mr. DOUGHERTY. Mr. Plater, if you would come around, please.

[Witness excused.]

DAVID A. ETNIER, called as a witness by and on behalf of the plaintiffs, after having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

By Mr. DOUGHERTY:

Q. Please state your full name for the record?

A. David A. Etnier.

[1–14] Q. Where do you reside?

A. 1405 Whitower Road in west Knoxville.

Q. How long have you been a resident of Knox County, Tennessee?

A. Approximately eleven years.

Q. Your present occupation or profession is what?

A. I am associate professor of zoology at the University of Tennessee.

Q. And how long have you been at the University of Tennessee?

A. Ever since I have been in Knoxville.

Q. Roughly since 1965?

A. Yes.

Q. Would you briefly relate for His Honor your educational background and experience.

A. Yes. I have a bachelor's degree in fish and wildlife management from the University of Minnesota; a PhD in zoology from the University of Minnesota, and immediately thereafter I took the assistant professorship at the University of Tennessee.

The COURT. Did you have any classes under Hubert Humphrey?

The WITNESS. No. He was around at that time but I don't know if he was actively teaching and I wasn't taking courses in those areas.

[1–15] By Mr. DOUGHERTY:

Q. You are what is known as an ichthyologist?

A. Yes. I guess that is correct.

Q. In laymen's terms that is what we call a fish expert, is that a fair statement?

A. Yes, that is fair.

Q. And you consider yourself an expert in the field of ichthyology?

A. If I have any expertise at all it would be in that area, yes.

Q. In addition to your work in the classroom, you have also engaged in considerable field experience with regard to the field of ichthyology?

A. That is true, yes.

Q. With respect to the area of ichthyology what is your primary field of specialty within that?

A. I specialize in the taxonomy and distribution and life history, perhaps, of fresh water fishes in southeastern North America.

Q. And for us laymen would you tell us what taxonomy is?

A. Taxonomy is the study of the, well, essentially the classification of fishes. The differentiation between closely related species, attempting to determine the bounds of different species, how variable they might be, [1–16] what their characters are.

Q. Have you also had experience in the field of systematics?

A. Yes.

Q. And would you relate for us in layman's terms what systematics are?

A. Systematics and taxonomy are approximately synonymous. Systematics is again the study of animal speciation, species boundaries, and things like that.

Q. I believe you conduct a laboratory here on the University of Tennessee campus, do you not?

A. I have a research laboratory, yes.

Q. And you also have certain collections?

A. Yes.

Q. Of fish species?

A. Yes.

Q. In your laboratory.

A. Yes.

Q. Could you give us the approximate number of those collections?

A. We have about 4,000 or so jars of fishes in the catalog collection and a large number that we haven't gotten around to putting up yet.

Q. Have you been involved in doing a good bit of writing in the field of ichthylogy in connection with your [1–17] field work and research?

A. Yes, I have.

Q. And has a lot of that research and field work been engaged in in the East Tennessee area?

A. Yes, a considerable amount of it.

Q. And, for example, with regard to the Hiwassee River, have you along with Mr. Robert K. Hitch conducted a study of the fishes of the Hiwassee River system?

A. Yes, I have.

Q. I show you here a document, Your Honor, which has been previously marked by the Clerk, and ask you if that is not a Xerox copy of the article which appeared in the Tennessee Journal in July of 1974?

A. Yes, it is.

Q. And does that relate to a study of the fishes in the Hiwassee River system?

A. Yes.

Q. Have you also had considerable experience with the Little Tennessee River system?

A. Yes.

Mr. DOUGHERTY. Your Honor, may we introduce that exhibit as No. 34, that being the —

The COURT. Received.

[Exhibit No. 34 was filed.]

[1–18] By Mr. DOUGHERTY:

Q. Now, Mr. Etnier, in your field work and research in the field of ichthyology, have you also other than the snail darter discovered and classified any new species?

A. Yes, I have.

Q. And could you give me the approximate number?

A. Well, all of my other descriptive work has been in the area of aquatic entomology, the study of aquatic insects. I specialize in one group called the Trichoptera or caddis fly.

I have described somewhere in the neighborhood of six or seven species of the caddis fly.

Within fishes, I am currently working on the descriptions of, actively working on descriptions of three or four other species.

Q. And one of those, I believe, is another undescribed darter; is that right?

A. Two of them are undescribed darters; yes.

Q. And where is one of them located with regard to an area other than the Little Tennessee River?

A. One of them occurs in the Duck and Buffalo Rivers and formerly occurred in the Elk, we believe.

Q. Is that in Middle or West Tennessee?

A. Middle Tennessee. The other one occurs in the Conasauga River which is part of the upper Coosa River [1–19] system south of Cleveland, Tennessee.

Q. That would be between here and Chattanooga, approximately?

A. Yes.

Q. What professional societies are you, briefly, a member of?

A. Well, the American Society of Ichthyologists and Herpetologists. I am also a member of the Tennessee Academy of Sciences, the Association of Southeastern Biologists, Sigma Xi. A number of other things, I guess.

Q. Have you also done a considerable amount of work in the field of darters?

A. Yes.

Q. And I believe one of the undescribed species that you are presently in the process of classifying is the Conasauga specimen, is a darter, is it not?

A. Yes.

Q. Now the snail darter you specifically discovered on August 12, 1973; is that not correct?

A. Yes, correct.

Q. In the Little Tennessee River at what we know as river mile 7 in an area called Coytee Springs?

A. Correct.

Q. And that is C-o-y-t-e-e, for the record. And on the occasion when you discovered this particular fish [1–20] what were you looking for?

A. I was involved with surveying the fish species in general of the lower part of the river. It had never been collected.

Q. And how were you doing that collecting, seining?

A. No. We were swimming through the water with face masks and snorkels.

Q. And were there other people with you?

A. Yes, Robert Stiles, from Sanford University was with me.

Q. I believe Sanford University is in Alabama; is that right?

A. It's in Birmingham.

Q. And when you were able to collect this particular species of fish and hold it in your hand, did you upon examining it ascertain that it was possibly something new?

A. As soon as I picked it out of the water I realized it was something unique in East Tennessee.

Q. Now the snail darter is part of what family of fish?

A. It belongs to the family Percidae.

Q. Is that essentially the perch family?

A. Yes.

[1–21] And the general designation is Percina, is that not correct?

A. Yes.

Q. Now what further subclassifications would there be going from the perch family, or Percina, as far as looking at this particular area of fish species?

A. Okay. Within the genus Percina there are six or seven recognized subgenera, which are smaller and less inclusive divisions.

The snail darter belongs to one of these subgenera, the subgenus imostoma.

Q. So when we refer to the name Percina imostoma tanasia, the Percina means essentially the perch family or Percina generally.

A. Percina genus, yes.

Q. And imostoma means the subgenus within the family Percidae or Percina, and the name tanasi, is what you gave this particular fish, is that right?

A. That's correct.

Q. At the time of your initial discovery of this fish did you subsequently engage in a comparison of this fish with another species within the subgenus imostoma?

A. Yes, I did.

Q. And for the record is a Percina ouachitae, Percina shumardi and an undescribed darter that you and Mr. [1–22] Williams are involved in describing, the Conasauga?

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A. Right.
Q. Percina uranidea?
A. Yes.
Q. And are there any others within the subgenus imostoma?
A. That is the subgenus.
Q. Does that comprise the entire——
A. The entire subgenus, yes.
Q. What particular specie in the subgenus imostoma does the snail darter most closely resemble?

A. Well, within the subgenus imostoma there are five species of saddle back—pardon me, four species of saddle back darters, ones with the distinct dorsal saddle, and the snail darter is one of these four.

Of the four species of saddle back imostoma, the snail darter is most closely related to the Percina uranidea, a specie that is now restricted to two river systems in the Ozarks. The White River system in Arkansas and a little bit of Missouri, and the Saline River system in southern Arkansas.

Q. In your experience with these darters and particularly the snail darter as you have observed it, what is the nature of the habitat for this particular species?

A. The only habitat that I have ever associated [1–23] them with is a rather large stream to a river type habitat with swift current flowing over generally rather fine gravel substrate possibly interspersed with boulders and with some sand. But generaly clean gravel substrate in a large to medium size river.

Q. And does the Little Tennessee River fit that description?
A. Yes, it does.
Q. Do the two rivers in Arkansas where the Percina uranidea is found have that habitat also?

A. Apparently so. The only time I have surveyed these rivers they were flooding very badly, but the indication I get from my colleagues is that they are very similar and it appeared to me that they were similar.

Q. What evidence do you have, if any, that any of the species that we call darters, within the subgenus imostoma, in any way live or reside in reservoirs or impounded areas?

A. The only evidence I have is that the most divergent member of the subgenus, this is the one that is not a saddle back darter, the Percina shumardi, does live in limpid type habitat,

that is, still water type habitat in parts of this range. It lives in Lake of the Woods in Minnesota, which is a still water habitat.

I have collected specimens in Tennessee in [1–24] the Tennessee River below Pickwick Dam, which is non-flowing habitat during some times of the year and a flowing water habitat at other times of the year.

But the saddle back members of the subgenus show no tolerance whatever to reservoirs in my experience.

Q. Is the shumardi a saddle back member?
A. No, it is not. It's quite different.
Q. The saddle back members are essentially the ouachitae Percina, ouachitae and the snail darter?
A. Yes, and the undescribed one from the Conasauga.
Q. Morphologically, and first of all in laymen's terms, what do we mean by that concept?
A. By which concept?
Q. When you say you are going to describe something morphologically?

A. Oh, this is a measurement of, well, I guess morphologically differences can be broken up into two or three different categories.

There are meristic characters which are things that are countable, such as the number of fin rays, the number of scales. There are morphometric characters which are measurable characters, such as the size of the eye, the length of the fins, the width of the body, and there are pigmentation characters that may be chromatic or [1–25] non-chromatic, that is, bright color or just the distribution of dark pigments on the body.

Q. Comparing the snail darter to the Percina ouachitae and uranidea are there distinct visual differences, morphological differences?
A. There are distinct morphological differences, yes.
Q. And just briefly for the record what are they?

A. The distinction between Percina tanasi and Percina ouachitae involves for the, the most obvious for sight identification is the position of the fourth dorsal saddle, which is consistently anterior to the caudle fin in ouachitae and consistently touches the caudle fin base in uranidea and tanasi.

Q. In laymen's terms could you tell us what you are talking about?

A. The caudle fin is the tail fin, of course, and the saddles are——

Q. That is just the rear end of the fish, in simple terms?

A. Yes. The saddles are dark pigment bands that go across back of the fish, and in all of the saddle backs there are four well-developed dark dorsal saddles.

In Percina uranidea and Percina tanasi, the [1–26] fourth saddle extends all the way back to the base of the tail fin.

Q. Using Exhibits 12 and 31, the drawing and the photograph, would you just briefly for His Honor show him what you are referring to as far as the—Your Honor, may I approach the witness?

The COURT. Yes. Mr. Pedersen, if you want to see it too, you can come up.

Q. [continuing]. Referring to as far as the saddles and various fins.

A. The saddles are the dark marks. Those are here, and one here that is hard to see, and this fourth saddle comes in contact right here with the anterior part of the caudle fin and it does that in all specimens that I have seen.

Q: In the drawing, which is Exhibit No. 12, I believe, I believe one of the species shown is a male and the other a female?

A. That's true.

Q. And is there a distinct difference in appearance or size or some other distinction as far as the male and female?

A. Yes. They are very distinct as adults, and this is unique for the subgenus imostoma. The males, the adult males, the anal fin gets extremely elongated. It may [1–27] be essentially twice as long as the anal fin of the female, and during the breeding season, which is in the winter and early spring, the anal fin and some of the other fins on the side of the body and side of the head get covered with small hard tubercles.

Q. I have to ask you what is a tubercle?

A. It is a clacareous secretion from, a little bony secretion from the skin that is used apparently for tactile stimulation of the female during spawning.

Q. Now in this particular exhibit, Exhibit 12, which is the male and which is the female?

A. The male is on the top. See the anal fin extending a way back and extremely enlarged.

Q. At this point in time, Dr. Etnier, in the scientific community, is there any disagreement as to whether or not this fish known as the snail darter is a new and distinct species?

A. There is none that I am aware of.

Q. Following your initial find of the snail darter on August 12, 1973, have you been involved in a continuous systematic study of the snail darter since that point in time through today?

A. I would say that my efforts at systematically studying the snail darter was essentially came to a halt after publication of the description of the species. I [1–28] haven't done additional work on it since then.

Q. And I show you a document which is a scientific paper dealing with the classification and designation of the snail darter as a species.

A. Yes.

Mr. DOUGHERTY. May we introduce that as Exhibit No. 35?

The COURT. Received.

[EXHIBIT NO. 35 was filed.]

By Mr. DOUGHERTY:

Q. This is a publication which was published in the Proceedings of the Biological Society of Washington; is that not correct?

A. Correct.

Q. And I believe you consulted with a number of people including the Smithsonian Institution as far as your research and determining comparisons to make sure that in your mind it was a legitimate new and distinct species?

A. A number of people from the Smithsonian or the U.S. National Museum are among the referees or the people who read the paper to check for its scientific merit and content.

Q. Was this paper reviewed by a number of people in the scientific communtiy?

A. Yes, by four or five people.

[1–29] Q. And is this a characteristic procedure for dealing with new classifications of species?

A. Most of the better journals are refereed, yes, before a paper can be accepted it must be read and approved by a member of the scientific community, experts in the field.

Q. This was done in this particular instance?

A. Yes, this was done in this particular instance.

Q. Now I believe you have a graduate student named Wayne Starnes, do you not?

A. That's true.

Q. Who is involved in a rather systematic and detailed study of the snail darter?

A. Yes. He's involved in studying the life history of the snail darter, the food habits, its reproduction behavior, its rate of growth, that sort of thing.

Q. And how long has that study been going on?

A. It has been going on essentially since the winter and spring of 1974.

Q. And how was this study initiated? Was there some sort of grant or funding involved?

A. Yes. In the fall of 1973, and this was now three months before the passage of the Endangered Species Act, Wayne Starnes and I went out to TVA with the personal conviction, of course, that the snail darter was going to [1–30] become extinct as soon as Tellico Reservoir was impounded.

We had already exhausted our last legal recourse when the NEPA cast lost, the National Environmental Policy case, challenging TVA on the——

Q. Environmental impact statement?

A. [continuing]. Environmental impact statement.

Q. All right.

A. So our only goal, well, I guess there were two goals involved. One goal was to try to learn as much about the snail darter as we could before it became extinct.

The other goal was to try to get some financial aid for a graduate student who was not really very well off financially.

Q. And that was Wayne Starnes?

A. That was Wayne Starnes, yes.

Q. And subsequently did TVA enter into a contract with the University of Tennessee and Mr. Starnes was ultimately the recipient of this grant through the University of Tennessee?

A. Yes.

Q. Since that time has he engaged in a rather detailed and extensive study of the life history of the snail darter?

A. Yes, he has.

Q. And have you and he worked closely during his [1–31] period of time that he has been involved in this study of the life history of the snail darter?

A. Yes, very closely.

Q. And I believe your lab facilities are next door to each other——

A. They are essentially the same facility.

Q. And you work in close proximity with him on a daily basis?

A. Yes.

Q. Now what is the importance of the sandy gravel substrate, and when we talk about substrate we are talking about river bottom, are we not?

A. Yes.

Q. And what is the importance of that along with the current to the habitat of the snail darter?

A. Well, darters, at least the less advanced onces, are fish that have rather high requirement for oxygen. They have high metabolic rates apparently and their oxygen retrieving system is not as good as it is in sluggish water fish like catfishes, for instance, and carp.

They require a source of water that has a high amount of dissolved oxygen, and in order to get sufficient oxygen it seems likely that they need water to be flowing so that they are constantly respiring or getting their oxygen from new water.

[1–32] The substrate——

Q. And this is one reason why the fast moving current is essential?

A. Yes. Either fast moving or else very high oxygenated water.

Q. All right.

A. The oxygen, the amount of oxygen is also very important to developing eggs, apparently.

A clean substrate that is silt free is apparently essential. If sufficient silt is present when the eggs are laid on a rock or on gravel particles or on top of the sand, silt settling down from the water column could and probably would smother the eggs and deny them sufficient oxygen for their development.

So they do not spawn in areas where there is a lot of silt. They must find ways to avoid siltation.

Q. Is there characteristically a small or large amount of dissolved oxygen in reservoirs or impoundments?

A. Reservoirs are extremely variable in that regard, but typically during the summer months, late summer months, the

lower levels of reservoir, the bottom layer of water may become virtually devoid of oxygen.

Q. And if that were the case in your opinion would the snail darter be able to survive in that situation of reservoir or impoundment?

[1–33] A. No, it would not.

Q. What is the characteristic situation that you have been able to observe in comparing, say, the Little Tennessee River area with water impoundment of reservoirs in the areas such as Fort Loudoun or the Watts Bar reservoir with regard to siltation as far as the bottom and whether this varies with seasonal fluctuations?

A. Well, I have done work around the edges of the reservoir, collecting fishes, and there is a considerable silt present in all the areas that I have been; whereas in the Little Tennessee River the substrate is so clean that it is very difficult to stir up the bottom enough to create sufficient turbidity so that fish will not see your seine.

The water continues to be so clear that they avoid your seine and it is very difficult to collect fish.

Q. And when we refer to turbidity, we are essentially talking about silt or mud in the water?

A. Yes.

Q. Clouding it up, is that not correct?

A. Correct.

Q. From the study that you and Wayne Starnes have been involved in with the snail darter and the life history studies that have been made specifically with regard to the snail darter, what is the life expectancy of a snail darter?

[1–34] A. Three to four years. Four years would be about maximum.

Q. And what is probably the most essential factor that is affected as far as, say, the snail darter is concerned, in connection with its habitat, food, reproduction or whatever other category we are talking about?

A. I am sorry, do you want to try that again.

Q. Let me get it to you this way .

In connection with the snail darter and its habitat, if there is anything which would moderate or change the habitat, such as the slack water and no current, or silt on the bottom, what

would that affect primarily as far as the snail darter being able to live and survive in the particular area?

A. It would very definitely be most noticeable in the reproductive success.

Q. And is that not probably one of the most key areas as far as the habitat area for a particular fish or species?

A. Certainly, certainly.

Q. Is it fair to state that frequently species of fish are found in maybe other areas where they do not reproduce?

A. Very definitely.

Q. I believe you observed yesterday with me a [1–35] film taken by Mr. Starnes, a short three to four minute film, that was taken of certain snail darters that he observed on April 17, 1970 in the Little Tennessee River just below Coytee Springs.

A. Yes.

Q. In your observations of that film—Your Honor, I intend to show the film, it is very short, to connect it up with Mr. Starnes in a moment—in connection with that film what did you observe with regard to the activities shown on that film as to whether or not you all have any definitive evidence of reproduction activity with regard to the snail darter in the Little Tennessee River?

A. Well, this particular film is a courtship sequence, as Mr. Dougherty says about three minutes long, which will show a male snail darter actively following and courting and perhaps actually spawning with a female snail darter several times.

Whether the spawning occurred or not, it's a little bit hard to say but they were certainly involved in spawning.

Q. Has there been any definitive evidence which demonstrates that any more clearly than what you have observed in the film, as far as any reproduction activity?

A. Well, last year at about the same time that Mr. Starnes made the film we collected adult males and [1–36] females in the same seine haul that were very obviously ready to spawn and probably in the act of spawning when we caught them.

Q. That was a year ago in March of 1975 or——

A. April.

Q. April of 1975.

A. Yes.

Q. Very briefly, Dr. Etnier, what is physically shown or demonstrated by the male and female specimens at the time of spawning, of the snail darter?

A. Well, in the female specimen any light pressure, actually just handling the fish, holding it in your hand, is sufficient to cause mature eggs to flow from the animal, and this is typical of the male too. Any slight pressure, well, sometimes just holding the fish if they are extremely high will result in milt flowing from the male.

Q. And when you say milt, m-i-l-t, is the word you used?

A. Yes.

Q. In your opinion is the mere evidence of milt in males or eggs in females evidence of any reproductive activity or successful reproduction?

A. It's no evidence of reproduction success certainly.

Q. And what would you require as an ichthyologist [1–37] to evidence some reproduction success, other than what we have mentioned?

A. Production of another generation of fishes.

Q. Basically another young snail darter?

A. Yes.

Q. And I believe the young snail darters are technically referred to as juveniles; is that correct?

A. Yes.

Q. Or subadults?

A. Yes.

Q. And that would take, that would be the nomenclature you used before they are one year old?

A. Before they are one year old they are typically called yearlings, and between their first and second years if they don't reach adulthood they are—I am sorry, young of the year within the first year and yearlings on the second year.

Q. Now, Dr. Etnier, you have examined the plans of the TVA in connection with the proposed closure of the Tellico Dam and creation of the Tellico Reservoir in the Little Tennessee River area?

A. Yes.

Q. And in that connection what is your knowledge with regard to the approximate depth of the area at Coytee Springs, for example, after the reservoir is created as [1–38] opposed to what it is now?

A. As I recall the reservoir will increase the depth of the Coytee Springs area by forty or fifty feet, something like that.

Q. And at the present time what is the approximate depth of the area of the Coytee Springs?

A. The average depth would vary from about two feet to three and a half feet depending upon the flow from the Chilhowee Reservoir.

Q. And, of course, from the Chilhowee Dam there are daily discharges of water which would somewhat affect the rise and flow of the river?

A. Correct.

Q. Up to this point in time with the Little Tennessee River as it is, the range of flow would be probably from two feet to approximately what at its maximum?

A. I would say it might come up an additional foot and a half or so, is about all.

Q. And the understanding that you have with regard to the impoundment, that the area there at Coytee Springs, for example, river mile 7, with the reservoir it would be approximately forty to fifty feet deep?

A. Something like that, yes.

Q. What has been the observations of Mr. Starnes and yourself with regard to the approximate range of the [1–39] snail darter in the Little Tennessee River either above or below Coytee Springs or in other areas of the Little Tennessee River?

A. It extends upstream nearly as far as the U.S. Highway 411 bridge. Perhaps within about two miles of the 411 bridge is the most upstream locality where we have seen it or collected it.

Downstream it extends to the mouth of the river, anyway, and TVA biologists have observed specimens slightly below the mouth of the river and, in one case, as far as ten miles below the mouth of the Little Tennessee River.

Q. Putting this in perspective, the Little Tennessee River is approximately thirty-three miles long from Chilhowee Dam to the proposed Tellico Dam where it joins Watts Bar?

A. Yes.

Q. And you are indicating that snail darters have been observed in the Little Tennessee primarily in the area of approximately where the mouth is with Watts Bar and going up about seventeen miles to approximately half its length, between Chilhowee——

A. That is correct.

Q. And Tellico Dam and Watts Bar.

A. Yes.

[1–40] Q. In connection with the estimated population of snail darters in the Little Tennessee River, have you and Mr. Starnes made any estimates of the number of snail darters that presently reside in the Little Tennessee River?

A. Yes. We have some crude estimates that are probably reasonably close, but the ones that we have been using of late is approximately ten thousand plus or minus five thousand individuals, and if we have made an error it is apt to be a conservative error. The population may be larger than that.

Q. If some experts or individuals involved in this matter, for example, had estimated the population of the snail darter in the Little Tennessee River may be two or three times ten thousand, would that surprise you?

A. It wouldn't surprise me. I would like to see the data on which this was based. It would not surprise me.

Q. Would you feel before such determination could be made there should have to be some scientific data to support that?

A. Yes, definitely.

Q. Now, Dr. Etnier, in your opinion does the mere finding of subadults or young snail darters in an area mean that a population of snail darters would be permanently established in that area?

[1–41] A. Certainly not.

Q. And why is that the case?

A. Well, for instance, at this very minute we could perhaps go over to Wayne Starnes' apartment and find subadult snail darters in his aquarium. This is not a reproducing population.

Once a fish has hatched and is capable of feeding, it no longer has as precise requirement, physical requirements, and it can live in essentially any sort of aquatic habitat where there is sufficient oxygen and sufficient food. Substrate no longer becomes so important.

Q. In connection with the snail darter what essentially are the food requisites?

A. In the Little Tennessee River its diet consists of about 90 percent small snails and limpets.

Q. From which comes its name?

A. Yes.

Q. And just for us laymen, what is a limpet?

A. A limpet is a snail that is not twisted; okay?

Q. Otherwise it's a snail that is twisted?

A. Yes.

Q. Now, have you made a study of the bottom organisms which are sometimes called benthos organisms, is that not correct?

[1–42] A. Correct.

Q. On the Little Tennessee River and some of the reservoir areas, such as Watts Bar and Fort Loudoun?

A. Yes. I have observed the bottom organisms anyway, to some extent.

Q. And are there any conclusions that you have arrived at with regard to the differences in the areas in comparison of benthos organisms in a particular river situation as opposed to the impoundment or reservoir situation?

A. There is very little similarity. The flowing water benthic animals live in the Little Tennessee River, and when you get into a reservoir situation the fauna changes to still water benthic animals.

Q. Now you say fauna, fauna is essentially fish; is that correct?

A. Fauna is animals.

Q. Now with regard to assuming just for the purpose of discussion, that the Tellico area were impounded, the Little Tennessee River, in your opinion what would be the effect upon the benthos organisms, that is, the bottom organisms of the Little Tennessee River?

A. The population, the what is now abundant population of snails, Hydropsyche caddis flies and a number of other groups of caddis flies, May flies, stone flies, and many other groups of aquatic insects, would essentially [1–43] be eliminated. There might be within each group a species or two that would have some reservoir tolerance, and there might be an area or two within the reservoir, essentially at the upper end and perhaps along the rip rap banks where some of these species could get above the silt and get sufficient oxygen.

But basically the river fauna of caddis flies and stone flies and May flies and river snails would be replaced by a reservoir fauna of midge larvae and perhaps a burrowing May fly and the Asiatic clam which is present in the river now.

Q. Now, Dr. Etnier, assuming that the Tellico Dam is closed and the Tellico Reservoir is created and the water impounded in the Little Tennessee River area, what is your opinion with regard to whether or not such creation of the reservoir and impoundment would jeopardize the continued existence of the snail darter and either destroy or modify the critical habitat as has been determined from river mile .5 to river mile 17 of the Little Tennessee River for the snail darter?

A. There is no doubt in my mind that it will do much more than jeopardize it. The snail darter will become extinct in the Little Tennessee River following impoundment of the Tellico Reservoir.

Q. And would you please relate to the Court why [1–44] in your opinion that would occur.

A. Our experience with the saddle back members of the darter subgenus imostoma indicates that when you build reservoirs they disappear.

In Georgia, the darter that Jim Williams and I are describing disappeared with the construction of the Altoona Reservoir.

A related species, Percina ouachitae, formerly occurred in the Tennessee River at least as far upstream as northern Alabama. It hasn't been taken in the Tennessee River subsequent to the impoundment.

There are examples in Arkansas. There are examples with other darters that the darter fauna disappears, with one or two exceptions, as soon as you create a reservoir.

The tailwater areas are also affected, in some cases.

Q. With regard to the habitat of the snail darter, is there any area above, say, river mile 17, that is, up from 411 bridge toward Chilhowee Dam, where with the impoundment of the reservoir the snail darter could in any way survive or have a habitat up there where it could live?

A. Apparently there is not or we would have snail darters in that area at present.

[1–45] Q. And, of course, that is contiguous body of water from the area where you found the snail darter up toward Chilhowee Dam?

A. Correct.

Q. And is it not a fact that a number of people, including TVA, have made a significant effort to try to find snail darters up in that location?

A. Yes, they have.

Q. And does it offer you some significance as an ichthyologist that a particular species of, let's say a percent of snail darters, is found in only one area of a continuous body of water such as the Little Tennessee River?

A. This is what you would expect essentially. There are such a large number of small fish species that, in rapidly flowing water and environments that they, in order to, well, perhaps although we can't be certain, avoid competition, they must become rather specialized in their habitat requirements, their ways of catching food, and as I see the situation in the little Tennessee River there are other species of small bottom dwelling fishes in the upper portion of the Little Tennessee River that are able to successfully outcompete the snail darter. The habitat is sufficiently different so that the snail darter no longer has any sort of a competitive advantage whatsoever.

Q. And with bodies of water there is a problem [1–46] of predator fish, in other words, bigger or more successful fish competing for the habitat of a particular area.

A. Yes.

Q. And would that be a factor probably upstream with regard to the snail darter in addition to the habitat?

A. It could well be, yes.

Q. Now, assuming, Dr. Etnier, that TVA has, for example, found three specimens of the snail darter within 1000 feet to 1500 feet of the confluence of the Watts Bar and Little Tennessee River, where they join in other words.

Assume they found one additional specimen at a location four miles downstream from the Little Tennessee River and the Watts Bar Reservoir; and assume further that they have seen or observed four additional specimens of the snail darter at a location approximately ten miles downstream from Watts Bar and the Little Tennessee River, would that in any way affect your opinion with regard to the Little Tennessee River and its impoundment, creation of the reservoir upon the snail darter?

A. It would not change my opinion the least in the effect of the impoundment on the population in Tellico and what would be Tellico Reservoir.

Q. Is there any evidence whatsoever that these eight specimens that they have observed in Watts Bar are in any way living there and reproducing there?

[1–47] A. Well, they were certainly living there at the time they were seen. There's no evidence there is reproduction.

Q. And reproduction would be an essential element in a continuous population of the snail darter?

A. Yes, it would.

Q. When two of those eight specimens were collected and delivered to Wayne Starnes by the TVA crew, what did those specimens evidence with regard to their appearance with regard to robust health or nutritional deficiency?

A. I haven't examined them closely myself but Wayne indicated that they appeared to be in somewhat poorer condition than specimens from the Little Tennessee River.

Q. And assuming that to be the case, what would that possibly communicate to you as an ichthyologist?

A. Possibly that the habitat is not, allows them to exist but does not allow them to prosper.

Q. And we are referring to the Watts Bar area below the Little Tennessee River?

A. Yes.

Q. In your opinion what are the probabilities that certain of the snail darters in the Little Tennessee River might go down into Watts Bar?

A. This is almost a certainty. This is typical [1–48] of darters, especially river darters of the genus Percina. During the wintertime a substantial portion of the population drifts downstream to deeper water areas.

Q. When does a snail darter in terms of your all's research and study engage in reproductive activity or spawning?

A. Well, we believe that reproduction is possible as early as January but that the bulk of the reproductive activity falls somewhere around mid-April, in that area.

Q. Now in connection with your conversations with TVA concerning the study of the life of the snail darter and the subsequent grant that was given by TVA to the University of Tennessee which Wayne Starnes was involved in, what discussions were had with you and Mr. Starnes and TVA in connection with a transplant and why did you even attempt to discuss that subject with them?

A. Well, originally we considered the possibility of moving the snail darters to another habitat. At least we wanted the research of Wayne Starnes to consider that possibility.

As I mentioned before there was no Endangered Species Act and the snail darter was destined to become extinct unless there was a possibility of finding another place for it to live.

Q. At the time you-all initially engaged in [1–49] these discussions the Endangered Species Act had not been adopted at that time?

A. Correct.

Q. I believe that date was approximately December, 1973 when it was adopted?

A. Yes.

Mr. DOUGHERTY. Your Honor, just for the record, I think from a technical legal point of view it would be our position that the issue of transplant would not be pertinent under the Act itself because the snail darter habitat and significant portions of the habitat is clearly in the Little Tennessee River but we understand that TVA may attempt to discuss it so I want to deal with it briefly with Dr. Etnier.

The COURT. All right.

By Mr. DOUGHERTY:

Q. In connection with the snail darter in terms of the study that you have been engaged in. Doctor, or rather Mr. Starnes has been engaged in would you say that the Little Tennessee River and particularly from river mile .5 to river mile 17 is a significant portion or major portion of the habitat of the snail darter?

A. It very definitely is, yes.

Q. Now in connection with the transplant, following your initial discussion what further discussions or [1–50] involvement did you and Mr. Starnes have with regard to any effort to transplant the snail darter?

A. In our preliminary talks with representatives from the TVA Wayne and I had considered some possible alternate sites for transplants, and there weren't very many that looked like they offered real possibilities but earlier I had been at least aware of the fact that there is some similarity between the benthic organisms, the small bottom animals of the lower Tennessee River and the lower Little Tennessee River.

Other river systems that are relatively unaltered in East Tennessee and Middle Tennessee seem to be less feasible

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than the lower Hiwassee for several reasons, primarily because they have a rather different character and because they have very dense populations of other species of darters which would provide perhaps more competition than the snail darter could handle, especially when it was just getting established.

Q. What evidence have you observed in the scientific community or have you learned of with regard to any successful transplants of darters?

A. There are very few successful ones that I know about. I know about several that have been unsuccessful.

Q. And I believe at a recent meeting of the [1–51] Association of Southeastern Biologists this past weekend, a paper was presented where TVA officials were present in connection with an attempted transplant of a darter and that this transplant was totally unsuccessful; is that not correct?

A. I think that a couple of the TVA biologists were present; this is essentially correct.

Q. I believe that darter was called the water cress darter?

A. Yes.

Q. It is true that some sporting fish and commercial fish have been successfully transplanted?

A. Yes.

Q. But from your knowledge and information and experience there have been no darters that have been successfully transplanted?

A. I believe there was a successful transplant of the log perch, one of the log perches into California waters.

The log perch is the most tolerent of all the darters that tolerates reservoirs, and moreover there are no darters with which it could compete in California. There are no darters in that area.

Q. In the Hiwassee River are there other darters that the snail darter would have to compete with?

[1–52] A. Yes. In the lower river there are perhaps seven or eight species of other species of darters.

Q. Could you mention just a few, very briefly?

A. Yes. The sharp head darter, the banded darter, the gilt darter, Tennessee snubnose darter, the speckled darter. Those would be the most common ones.

Q. In terms of the studies that you and Mr. Starnes have been engaged in and based upon your experience as an ichthyologist, do you have an opinion as to whether or not the attempted transplant in the Hiwassee River by TVA will be successful, and also considering the evidence thus far with regard to the transplant?

A. I think there is some possibility but, well, perhaps I could put this in an understandable framework.

If I were a betting man I would want extremely good odds to bet on the success of the transplant. I think it has a chance but a slight chance.

Q. And at this point has there been any definitive evidence that the transplant is successful?

A. Nothing that I am aware of.

Q. And is it not a fact that, I believe, as late as yesterday nine specimens of the snail darters were observed in the Hiwassee River in a transplant area in a rather emaciated condition?

A. I have heard this, whether it is true or not [1–53] I don't know.

Q. Now, Dr. Etnier, I think I am almost through with Dr. Etnier, Your Honor, a few more questions—in connection with the Hiwassee River, are there other members of the perch family in the Hiwassee River?

A. Yes, sir.

Q. Or Percina family?

A. Yes.

Q. And how many other members of the Percid family are there that you are aware of?

A. There are, in the entire family, there would be about ten or twelve species that would either live in or move through the lower part of the river.

Q. And in the Journal of the Tennessee Academy of Science, which contains in the July 1974 issue your article with respect to the fishes of the Hiwassee River system, do you not list approximately eight to ten members of the Percid or perch family that you have actually observed yourself in the Hiwassee River?

A. Yes.

Q. In connection with those members of the Percid family, do they spawn at the same time as the snail darter does, those that are in the Hiwassee River?

A. There would only be one or perhaps two other perches that might spawn that early—well, perhaps [1–54] three.

The sauger is an early spawner, and surely it uses the lower Hiwassee as a spawning area.

I suspect that there may be occasionally walleye that spawn in the lower Hiwassee River although I am not aware of any specimen.

And two other darters would begin spawning just about the time the snail darter is reaching maximum spawning condition. By the first of April the Tennessee snubnose darter and speckled darter will both be spawning and the snail darter is still spawning by the middle of April, or the 20th of April. There is some overlapping.

Q. Is there any particular characteristic of the eggs of the Percid family in its larval stage?

A. That identifies it as a Percid?

Q. Yes.

A. Not that I am aware of. The perch-like fishes, the order—a group that includes maybe an additional forty or fifty families, many of the other families have eggs that are similar in appearance to those of the true Percids, as far as I know.

Q. Now if one of these eggs, and we talk about the larval egg, what is that?

A. As I understand it, I guess it would be an egg that has a developing embryo in it, a well-developed [1–55] embryo that has not yet broken the eggshell and hatched, so to speak.

Q. In your experience as an ichthyologist with regard to the Percid or perch egg in the embryo stage, is there any particular aspect or evidence that particularly denotes, for example, the Percid egg from some other egg?

A. Well, I am not an expert on larval fishes but the larvae fish literature that I am aware of indicates that there is a conspicuous anterior oil droplet in the yoke cavity of a developing Percid egg, but this oil droplet is also present in white bass eggs, for instance, and in sunfish eggs, and since these are all perch-like fishes and very little work has been done in this area, I would be inclined to suspect that many other perch-like fishes have similar larvae.

Q. Is there a particular name for those other type species other than particular members of the Percina or perch family?

A. Different families. Some of them live in the Hiwassee River.

Q. And is one of them called the Percoidea?

A. Yes. This is the family name for a common white bass or stripe that the fisherman will recognize.

Q. And is that fish located in the Hiwassee River?

[1–56] A. It is abundant in Watts Bar Reservoir and I suspect it makes spawning runs into the Hiwassee, yes.

Mr. DOUGHERTY. I think, Your Honor, the defendant may ask him.

The COURT. Do you want to cross-examine him?

CROSS-EXAMINATION

By Mr. WAGNER:

Q. Dr. Etnier, I think you said that you discovered the snail darter on August 12, 1973.

A. I believe that is correct, yes.

Q. And immediately you thought that this was a different species of fish for this section of the country?

A. For this section of the country, yes.

Q. And you did some immediate work there on the problem, didn't you?

A. Yes.

Q. And was your initial work completed before the second Tellico trial?

A. Before the second Tellico trial I had a preliminary indication of the taxonomic status of the animal, yes.

Q. And you felt it was a new and distinct species at that time?

A. I was basing this opinion on the opinion of [1–57] a colleague who was also quite, very competent with darter systematics. At the time of the trial I had not yet had a chance to examine specimens of Percina uranidea, a closely related species.

Q. You did report to the lawyers prior to the trial you felt you had discovered a new and distinct species in the Little Tennessee River?

A. I believe it was actually while the trial was in progress or just before trial, yes.

Q. But you did report to him to that effect?

A. Yes.

Mr. DOUGHERTY. May I make one comment, I think it is clear that that matter was not mentioned in the previous NEPA trial before Your Honor.

The COURT. Well, I don't think it is important enough to discuss it. Go ahead, go ahead. Cross-examine him.

BY Mr. WAGNER:

Q. Now then, before this particular fish was listed as an endangered species, you went to the TVA with the proposal to research it, is that correct?

A. Yes.

Q. And TVA sponsored your research as you requested?

A. TVA sponsored the research of Wayne Starnes, [1–58] yes.

Q. It sponsored the research which you had requested?

A. Yes.

Q. I think you submitted an initial proposal to TVA in December 1973, did you not?

A. I don't recall the date.

Q. I would like to hand you a copy of that proposal of research and ask you if you can identify it.

A. It looks very much like a copy from my typewriter, yes. I haven't seen it for a long time.

Mr. WAGNER. All right.

Mark that as an exhibit to his testimony, please.

[Exhibit No. 36 was filed.]

By Mr. WAGNER.

Q. Now it is my understanding that TVA did sponsor this research and pay for it?

A. Yes.

Q. And they did it before the fish was listed as endangered or any action was taken on the status of the fish?

A. They did it before there was an Endangered Species Act, essentially. Yes, it had not, certainly not been listed since it couldn't have been.

[1–59] Q. Before there was an Endangered Species Act and certainly before it was listed?

A. Yes.

Q. And at the time you made this proposal I think you had had substantial experience on fishes, and so forth, in the Hiwassee River?

A. I had worked in the Hiwassee River, yes.

Q. And shortly after that you published a paper dealing with fish and fauna, and so forth, in the Hiwassee River?

A. It had been published previous to that time, I think. I am not sure.

Q. Now then, in connection with your objective that you proposed to the TVA, you specifically proposed to transplant in the Hiwassee River, did you not?

A. I don't recall. I think I mentioned, I am sure I mentioned the Hiwassee River as one of the possibles, as a possible site to consider for transplants. But I don't know if I made the statement indicating that we would transplant into the Hiwassee.

Q. I would like to call your attention to the second full paragraph on page 5 of your proposal. I would like to read that to you and ask you if it is correct.

A. OK.

Q. [Reading:] The Hiwassee is the site most [1–60] similar to the Little Tennessee River due to the presence of upstream dams and other considerations. Indeed it seems possible that the Hiwassee River may have once been its home since its range might well have been more extensive in the times before widespread deforestation increased river temperatures in eastern Tennessee. If this fish did exist in the Hiwassee or other rivers, it might have been eliminated by warmer temperatures; the Little Tennessee was perhaps the only sufficiently large local river which didn't warm too much because its watershed remained mostly forested, so it became the refugium of any cold-adapted obligate-river species. The river waters in several areas, once warmed by man's activities, have now been cooled by his dam-building practices, thus perhaps restoring an appropriate environment for such species.

A. That sounds like it, something I would have said, yes, very much.

Q. So at that time you did feel like the Hiwassee River was an appropriate area for transplantation and successful reproduction of this species?

A. I felt there were possibilities and I still do.

Q. Now then, based on the information presently available, isn't it a fact that TVA transplant of the snail darter

into the Hiwassee River appears to be a successful [1–61] transplant to date?

A. Definitely not. I see no—I have no reason to believe that.

Q. Have you followed the sexual progress of the snail darter in the Hiwassee River?

A. Sexual progression of the snail darter in Wayne Starnes' aquarium is perhaps parallel. They reach sexual maturity when they get large enough to reach sexual maturity.

Q. Doctor, I don't think you answered my question. Have you followed the sexual progression?

A. Yes, I am aware of the reports of the biologists who have been studying the situation, yes.

Q. Have you been there yourself and observed them?

A. I have been there several times but I haven't seen any snail darters.

Q. Now then, we talked a moment ago or you talked on direct examination that you had heard that snail darters in the Hiwassee River, nine snail darters were observed yesterday and appeared to be in an emaciated condition; is that correct?

A. I overheard that, yes.

Q. Who did you hear that from?

A. I don't recall the source.

[1–62] Q. Doctor, isn't it a fact that darters immediately after spawning have the appearance of being in an emaciated condition?

A. In fact, if they are adults they probably will not live very much longer after their third or fourth year spawning act. This would not be unusual, very definitely.

Q. So the answer to my question is yes, after spawning they do appear to be in an emaciated condition?

A. They very likely would, yes.

Q. So that could be some indication that those nine fish that were seined had just completed spawning?

A. It's possible.

Q. Doctor, how many different species of darters are there in the Tennessee River system?

A. I would say approximately forty or forty-five in the Tennessee system.

Q. How many in the State of Tennessee?

A. About eighty-five or ninety.

Q. And how many in the world today?

A. One hundred twenty, one hundred thirty.

Q. Doctor, is it difficult to tell different darters or different species of darters one from the other?

A. It can be extremely difficult, yes.

Q. And with respect to the, I think it's the [1–63] stargaze darter, isn't it, over in Arkansas?

A. Yes.

Q. With respect to the stargaze darter as opposed to the snail darter, the only major factor that distinguishes those two apart is the distance in miles?

A. I don't think that's quite fair, no. The difference involves a number of countable differences, a number of measurable differences, and some breeding color differences and some breeding tubercle differences and very likely differences in vertebral numbers.

Q. In connection with presenting your paper in trying to establish the difference between the snail darter and the stargaze darter, wasn't this one of the major factors that you considered to support the separation?

A. It's a factor. No, I don't think that was the major factor. No, the major factor is that the differences between the snail darter and the Percina uranidea are approximately of the magnitude as the differences between the stargaze darter and the Percina ouachitae, which lives together in the same Ozarkian stream and don't interbreed. So thus they fulfill the prime requirement of a biological species that they maintain the species identity when living with close relatives.

Q. Doctor, how many new species of darters have [1–64] been discovered and/or classified in the last five years?

A. I would say the number would be somewhere between eight and ten, something like that, or eight to twelve, in the last five years.

Q. So new species of darters are being discovered and classified most every year?

A. Yes, I would say the rate would be to the point of about one a year, something like that.

Q. Now inasfar as different species of animals, isn't it a fact that there are over, in the neighborhood of 20,000 new species of animals discovered each year?

A. I don't know.

Q. Would that be a close figure?

A. I wouldn't even know if it was close. It doesn't seem particularly out of line but I have no way of knowing.

Q. But there are substantial numbers of new species of animals that are being discovered and classified each year?

A. This is true.

Q. Doctor, I would like to hand you a vial which contains four darters and I would also like to hand you a piece of paper and ask you to pull them out, put them on the piece of paper and explain to the Court the difference between the various darters.

[1–65] There are two snail darters and two other species of darters, and if you would——

A. What is the fluid that these are in, is it water?

Q. I have no idea. No, I think it's a preservative of some type.

A. Alcohol?

Q. I will pull it out for you.

[Remarks of counsel off the record.]

A. These specimens are quite small and I, without access to a dissecting scope, I would be hesitant to make a certain determination. These two would appear to be juvenile snail darters.

This on the basis of the length and pointedness of the pectoral fin which is a character that is quite useful but not one hundred percent, this would appear to be a stargazing darter. I can't be certain without looking at a scope, but notice the rounded nature of the pectoral fin on this one. It's slightly different.

This tiny specimen is in the same species group, which species it is I don't know. I would have to look at it under a scope. I would like to be able to count the fin rays and have access to some measurements.

Q. Let's make sure we have them right, Doctor. You say this darter is a stargazing darter?

[1–66] I don't say that it is but it might well be. It appears to look more like a stargazing darter than a snail darter, but it could be either one.

Q. It could be either one?

A. Yes.

Q. There is very little difference then?

A. Very little difference that you can see on juvenile individuals without a dissecting scope, yes.

Q. I would like to ask you to put this darter that you have identified as a probable stargazing darter into the vial and mark that as an exhibit to your testimony.

The COURT. He doesn't do that. Do you want to do it?

Mr. WAGNER. Yes, Your Honor.

The COURT. All right. Mark it then.

[EXHIBIT No. 37 was filed.]

By Mr. WAGNER:

Q. This appears to be a snail darter then?

A. It appears to be but it could be a stargazing darter too. Like I say it's a juvenile specimen and without access to a dissecting scope and the tools of my trade, so to speak, I certainly would not make a positive determination of it.

As a matter of fact, even with a scope I might not be able to make a positive determination based on [1–67] one juvenile individual.

Q. And on these other two smaller darters, you don't know what they are?

A. Well, they are Percina uranidea, or Percina tanasi. They are not Percina ouachitae. They are one of the two species that are closely related.

Q. Are you saying that they could be either one?

A. Yes.

Q. Such as these.

A. Yes.

Mr. WAGNER. Thank you. I would like to have these marked as exhibits as well.

The COURT. Do you offer them?

Mr. WAGNER. Yes, Your Honor.

The COURT. Mark them, Mr. Ford. They are received.

Mr. WAGNER. I would like to have this one, the larger specimen, marked separately and the two smaller specimens marked collectively.

[Exhibits Nos. 38 and 39 were filed.]

By Mr. WAGNER:

Q. Would it be fair to say, Dr. Etnier, that the TVA biologists have cooperated with you in all respects in your research with regard to the snail darter?

A. Not in all aspects, I wouldn't say that would [1–68] be fair, no.

Q. To what extent have they not been cooperative?

A. They have cooperated with me to the extent that the organization allows them to cooperate with me. I have had good working relations with them.

Q. You have?

A. Yes.

Q. And have you also cooperated with TVA and with the biologists in connection with their transplant program in their effort to save the snail darter?

A. Whenever I have been asked to, yes, I have.

Q. Doctor, you have been opposed to the Tellico project since well before the discovery of the snail darter, have you not?

A. Correct.

Q. And you have expressed opposition to it in court and otherwise prior to discovery of the snail darter?

A. Yes.

Q. Dr. Etnier, during a normal evolution of nature isn't it a part of nature that species come and go?

A. Correct.

Q. And nothing unusual about that?

A. Correct.

Q. And over the years would it be fair to say that literally millions of different species of animals have [1–69] come into being and become extinct in the natural process?

A. Well, the number may be large but very large numbers have become extinct through natural processes, yes, over a period of four hundred million years, or so.

Q. Doctor, in the process of nature what causes these species to become extinct?

A. Well, perhaps the two most important things would be the change—the single most important thing would be the changes in the habitat which made physical or biological changes.

Physical changes would be things caused by such epic events as continental drift where the continents move in relationship to the equator as far as relationship to one another, or catastrophic events such as volcanoes, extremely severe storms, changes in climate that make areas more arid or more moist, and biotic factors such as the evolution of species that are better

able to compete for the requirements of life than are the species that are about to become eliminated.

Q. In other words, through nature some species become so specialized that they are unable to compete and they become extinct naturally?

A. I think that's fair, yes.

Q. Doctor. I think you have a great deal of respect for the TVA biologists that are working in snail [1–70] darters on the program. don't you?

A. The ones I know, yes.

Q. Which ones do you know?

A. I know Charlie Saylor and Dick Fitz very well. I know some of the others less well. Those would be the two that I know the best.

Q. Doctor, did it surprise you when the TVA biologists found the snail darter below the mouth of the Tennessee River and Watts Bar Reservoir?

A. The finding ten miles below the mouth of the reservoir surprised me, yes. I would not have anticipated that.

The findings within the area of the mouth of the dam were really quite expected, I think.

Q. What about the four miles below the mouth of the river, was that a surprise?

A. It is somewhat in between expected and a surprise; about halfway in between.

Q. Wayne Starnes also found a snail darter four miles below the mouth of the river?

A. He observed one, yes.

Q. Pardon?

A. He observed one, yes.

Q. Have you also heard that TVA biologists have observed snail darters below the or in the Chickamauga [1–71] Reservoir below the Watts Bar Dam?

A. I have heard a rumor to that effect, yes.

Q. If that turns out to be a fact would that surprise you?

A. Yes.

Q. What would that mean to you, Doctor?

A. This would essentially mean that there is a reproducing population of snail darters in upper Chickamauga Reservoir. The size of it, the extent of it we would have no way of know-

ing, but if it is there there's no way of writing these off as downstream migrants from the Little Tennessee River, in my mind.

Q. Now in the Chickamauga Reservoir and the Watts Bar Reservoir, the upper reaches, there is substantial current, is there not?

A. There is during certain parts of the year, yes, during the times of the vear when reservoir levels are low, low pool.

Q. What about during the summer?

A. I haven't looked at these areas at full pool and I really don't know how much current there is or how much they change.

Q. So you know during the winter pool there is substantial current and vou don't know whether or not there is current in the summer pool or not?

[1–72] A. Yes, I don't know the nature of the summer habitat.

Q. Do you also recognize that in the Tellico Reservoir after impoundment that in the upper reaches, up above the 411 bridge, there will be substantial current in those areas?

A. Yes, I suspect there will at least at times.

Q. Now the substrate in those areas at the present time is clean and there are some gravel substrate areas similar to that in the neighborhood of Coytee Springs, is it not?

A. It is not particularly similar. When you get up above the 411 bridge into the shoal areas you run into large boulder and bedrock deposits, much more than the fine gravel which you have in the lower part of the river.

Q. There are some similar areas there?

A. There are some small areas that have rather similar habitat, yes.

Q. Doctor, I think the paper that you published which classified the snail darter was published on January 22, 1976?

A. That seems about right, yes.

Q. And, in other words, the formal classification of the snail darter came some several months after the listing of the snail darter as an endangered species?

[1–73] A. I would say the formal publication of the description came after the listing, yes.

Q. So, in other words, the Department of the Interior listed a species as endangered before it was classified as a specie scientifically?

A. Before it was published. I think there is somewhat of a difference.

Q. Doesn't it require in the scientific community a formal publishment before it is considered to be a recognized species?

A. The formal publication makes the name available. The biological facts of the matter may be known long before the name is available.

Q. You are working now on classifying two other darters; is that correct?

A. Yes.

Q. Who are you working with on those?

A. I am co-authoring both of the darter publications with Jim Williams.

Q. Who is Jim Williams?

A. He is an ichthyologist who is now the ichthyologist at the U.S. Endangered Species Office in the Interior.

Q. Is he the only ichthyologist in the U.S. Fish and Wildlife Service of the Interior, the Endangered [1–74] Species Office there?

A. He is the only one in the Endangered Species Office, as far as I know, yes.

Q. Is he the person that has been in charge of the TVA snail darter listing, and so forth?

A. He has been involved with it. I don't know where the lines of forces go in the Endangered Species Office, so I don't know who's really in charge of it.

Q. Have you discussed——

Mr. DOUGHERTY. Your Honor, may I ask a question?

The COURT. Yes.

Mr. DOUGHERTY. I think some of Mr. Wagner's questions are being directed to the listing by the Department of the Interior of the species and the critical habitat, and I sort of had the feeling that TVA essentially acknowledged and admitted that, and unless we have some issue of that I don't really see any necessity of really getting into that. The items are in evidence and I think that really is not an issue before us as far as the listing in the endangered species and critical habitat.

The COURT. Your examination was very comprehensive and I do not feel like cutting him off in the light of that situation.

[1–75] I think both of you are going far afield of the controlling issues in this lawsuit.

With that explanation I hold——

Mr. WAGNER. I will move on, Your Honor.

The COURT. Yes, and hold it within limits, please.

Considerable of the testimony is not competent under the Rules of Evidence that has been introduced thus far. In other words, the Doctor is talking about what Tom, Dick and Harry said, what they said, and that isn't competent testimony. That is hearsay testimony as you lawyers know, but I have been liberal with both sides and I intend to continue that way provided you don't abuse that privilege that I have extended to you. If you do I will cut you off.

Mr. WAGNER. Thank you, Your Honor.

By Mr. WAGNER:

Q. Doctor, you stated your opinion earlier as to whether or not the snail darter will become extinct in those sections of the Little Tennessee River covered by the impoundment. Isn't it a fact that with regard to matters such as this that experts often disagree?

The COURT. They disagree on everything, experts do. I know that. You need not go into a [1–76] lot of that.

The WITNESS. Thank you.

Mr. WAGNER. That is all.

REDIRECT EXAMINATION

By Mr. DOUGHERTY:

Q. Two or three quick questions, Your Honor.

Dr. Etnier, aside from the fact that there are a number of darters, how many of those darters have been listed as endangered species by the Department of Interior?

A. As far as I know there are only three.

Q. And is one of those the snail darter?

A. Yes.

Q. Now with regard to these specimens that Mr. Wagner presented to you for examination a little earlier, if these specimens were adult would it be easier to examine and identify?

A. They would be somewhat easier but I would still like to have access to a dissecting scope and a larger number of specimens.

Q. Now, Mr. Wagner asked you about your opposition to the Tellico Dam and project. Why are you so opposed?

A. I feel very strongly about the fact that one of the significant types of environments in North America is [1–77] being lost, and is virtually completely lost at present, and this is the big river environment.

There is nothing left of the original Tennessee River, main channel Tennessee River; it's impounded from end to end. The Cumberland River is gone. Dams are planned on the Duck River. The Holston rivers are gone; the Clinch has a little bit of remaining headwater, and there are a number of fishes and insects and aquatic mussels or clams that are dependent upon big river habitat for a place to live.

We are going to lose this fauna along with the big river habitat and this is one of the things that I am very much opposed to.

Q. When you talk about big rivers you are including the Little Tennessee River in that category?

A. Yes. It has the fauna associated with the big river.

Q. And when you refer to Fort Loudoun or Watts Bar, these other impounded areas, you are talking about them as being reservoirs?

A. Yes.

Q. In connection with the matter which Mr. Wagner raised about the specimen of the snail darter supposedly being observed below Watts Bar Dam in the Chickamauga Reservoir, is it possible that that could be one of the specimens from the Hiwassee River in the transplant area [1–78] that washed down through the dam into the Chickamauga Reservoir?

A. It's quite a long ways. It is within the realm of possibility, yes.

Q. And would this be more a possibility if the——

The COURT. That is argument. Let's go to factual matters. Go ahead.

Mr. DOUGHERTY. My only purpose, Your Honor, is to state his opinion.

The COURT. I know, but I am satisfied on what the Doctor has testified on that. If you have anything new I will hear you but don't just ask questions for the purpose of asking questions.

By Mr. DOUGHERTY:

Q. Dr. Etnier, in connection with the Tellico project and your involvement with TVA and the question of transplant, has any

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of the representatives of TVA ever mentioned anything about possibility of modifying or altering their plan with regard to the Tellico project in connection with this snail darter?

A. No.

Mr. DOUGHERTY. That is all I have, Your Honor.

The COURT. That's all, Doctor.

Now have the next witness on the stand when [1–79] we get back in here. We are going to take a short recess, Gentlemen.

[Witness excused.]

[A short recess was taken, after which the following proceedings were had:]

The COURT. All right, Gentlemen, you may proceed.

WAYNE CALVIN STARNES, called as a witness by and on behalf of the plaintiffs, after having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

By Mr. DOUGHERTY:

Q. Please state your full name for the record?

A. Wayne Calvin Starnes.

The COURT. Now I accept what the Doctor said. Don't have him to repeat what the Doctor said. Anything that the Doctor didn't cover then you will be free to go into, but repetition is not necessary because the Doctor covered the area thoroughly. I accepted what he said about it.

Mr. DOUGHERTY. Insofar as his testimony might be cumulative, and obviously he would be prepared to testify in other areas.

[1–80] The COURT. Yes. Well, now, in other areas.

Mr. DOUGHERTY. No, I am talking about in some of the same areas that Dr. Etnier would, I would obviously be prepared to offer that but I don't propose to if they would——

The COURT. You will stipulate that he will testify substantially as did the Doctor in the areas covered by the Doctor, will you not?

Mr. PEDERSEN. Yes, Your Honor.

The COURT. Yes, they stipulate and the record will show.

By Mr. DOUGHERTY:

Q. Mr. Starnes, what is your age?

A. Thirty.

Q. Where do you reside in Knox County?

A. 915 22nd Street.

Q. And I believe you are a graduate student at the University of Tennessee?

A. That is correct.

Q. And a graduate student under Dr. Etnier?

A. That is true.

Q. Your field of pursuit is the field of ichthyology; is that not correct?

A. That's true.

Q. And how long have you been so engaged in this [1–81] doctorial program?

A. In the doctorial program, oh, nearly three years.

Q. You also have an MA degree or an MS degree?

A. MS.

Q. What is that MS degree in?

A. Same field.

Q. Ichthyology?

A. Yes.

Q. And I believe you also have a BS degree from the University of Tennessee also?

A. Yes, I do.

Q. When did you commence the study of the life history of the snail darter?

A. The summer of 1974.

Q. And you have been engaged in it on a detailed daily intensive basis since that time?

A. Daily? I have been intensive.

Q. Almost daily.

A. On an intensive basis, yes.

Q. And in that connection, for example, how many times have you visited the Little Tennessee River over the last year and a half?

A. Approximately 75 to 80 times.

Q. And made collections of the snail darter and [1–82] other species?

A. Or observations.

Q. Have you also engaged in observations in the Hiwassee River?

A. Yes, I have.

Q. Have you also engaged in at least one observation in the Watts Bar Reservoir?

A. Yes, I have.

Q. And I believe that location was approximately four miles downstream?

A. Yes, it was.

Q. Now as a part of your research study you have aquariums and you engage in the study of fishes as they live in the aquariums, do you not?

A. Yes, I do.

Q. You analyze them and engage in studies under the dissecting scope and things of this sort?

A. Yes, I have.

Q. You have viewed the various stages of the life history, the various periods of times from birth until they probably die; is that not correct?

A. Most periods, yes.

Q. And you would agree the life history is about three to four years?

A. True.

[1–83] Q. Now in that connection, have you also made collections of the eggs of the snail darter?

A. From gravid females, yes.

Q. And have you observed the sexual progression of the snail darter both male and female?

A. Yes, I have.

Q. Now in that connection were two specimens of the snail darter delivered to you by certain members of the TVA crew within the last month or two that were collected, one at a location four miles downstream from the mouth of the Little Tennessee River and Watts Bar Reservoir and another one collected at a location somewhere between 1000 and 1500 feet below the confluence of the Watts Bar and the Little Tennessee River?

A. There were.

Q. And did you examine those two specimens under a dissecting scope?

A. Yes, I did.

Q. And how did those specimens appear with regard to whether or not they were nutritionally deficient or robust in health?

A. They were relatively less, relatively less nutritional condition than darters from the Little Tennessee River.

Q. And were the food organisms that you found [1–84] in their stomachs different from what you would find in the snail darter specimens you found in the Little Tennessee River?

A. Almost entirely, yes.

Q. And in addition to examining the snail darter, observing its life history, sexual progression, have you also dissected them and analyzed stomach contents in a number of occasions?

A. Yes, I have.

Q. And I believe the snail darters that you have observed and dissected in the Little Tennessee River primarily were composed of, stomach contents that is, of snails?

A. That is true.

Q. And the specimens that you observed——excuse me, the two that you dissected from the Watts Bar Reservoir primarily had a few snails and primarily limpets or smaller organisms?

A. There was one terrestial snail, no river snails.

Q. Now in connection with the Watts Bar Reservoir, have you yourself engaged in scuba diving at the location four miles downstream from the confluence of the Watts Bar Reservoir and Little Tennessee River?

A. Yes, I have.

Q. In connection with the appearance of the [1–85] bottom in that particular area, how did it compare with the Little Tennessee River in that substrate?

A. The bottom of the Watts Bar had about a quarter inch to half an inch silt burden over an old gravel bed as compared to clean swept gravel in the Little Tennessee River.

Q. And what is the significance of that observation in connection with whether or not that would be a good habitat in the Watts Bar for reproduction of the snail darter?

A. Siltation almost certainly has a detrimental effect on the eggs which are deposited in the substrate.

Q. Why is that?

A. It is a smothering effect.

Q. Smothering effect?

A. Yes.

Q. And does this involve not only the ability to get oxygen but other factors?

A. Certainly.

Q. Is it fair to state, Mr. Starnes, that you have engaged in a detailed study of the life history of the darter and all its facets probably more than any other human being?

A. Well, as much as a couple of other human beings, I guess.

[1–86] Q. Would you include Dr. Etnier in that category?

A. In the life history?

Q. Yes.

A. Not quite as much.

Q. But to a significant degree?

A. To a significant degree, yes.

Q. Based upon your observations and experience with regard to the snail darter and its habitat in the Little Tennessee River, do you have an opinion as to whether or not the closure of the Tellico Dam and the creation of the Tellico Reservoir and impoundment, will jeopardize the continued existence of the snail darter and destroy or modify its critical habitat as it has been determined by the Department of the Interior in the Little Tennessee River?

A. Yes, I do.

Q. And what is that opinion?

A. I feel that the majority or all of the reproducing population of the snail darter will be exterminated.

Q. Exterminated?

A. Yes.

Q. And with regard to the population that is in the Little Tennessee River now, I believe you are the primary [1–87] person responsible for estimating and evaluating that population. You have estimated there to be at least 10,000?

A. Yes, I have.

Q. Assuming that TVA found approximately eight specimens of the snail darter in Watts Bar, either at the confluence with the Little T or four miles downstream or ten miles downstream, does this in any way affect your opinion with regard to the significant portion of the range for the snail darter being in the Little Tennessee River?

A. Not the significant parts nor the reproducing population, no.

Q. Do you have an opinion as to whether the snail darter can reproduce in the Watts Bar Reservoir?

A. If it does it would be highly marginal.

Q. And in that regard would it be significant enough to sustain an effective population of the snail darter in your opinion?

A. I don't believe so.

Q. Assuming the same hypothesis that TVA found approximately eight specimens, two of which were collected in Watts Bar below the mouth of the Little Tennessee, would that in any way affect your opinion as far as the effects of the closure of the Tellico Dam and the creation of the reservoir on the snail darter in the Little Tennessee River?

A. No.

[1–88] Q. With regard to the transplant area in the Hiwassee River, have you been given any evidence whatsoever from a scientific point of view that would indicate there has been successful reproduction in the Hiwassee River of the snail darter?

A. No, I haven't.

Q. And out of approximately 771 snail darters that were transplanted in the Hiwassee River, what evidence has been given to you as to the number of snail darters that have been observed since that transplant at those three locations in the Hiwassee River?

A. Strictly hearsay from TVA biologists.

Q. Is it fair to state the number they have observed has been relatively small?

Mr. WAGNER. We object as hearsay.

The COURT. Well, I will let you put it in but, you know, as well as the Court if it is hearsay evidence——

Mr. DOUGHERTY. I understand, Your Honor. Of course, these are statements of representatives of the defendant.

The COURT. I understand that but that wouldn't make it competent.

Mr. DOUGHERTY. I understand.

The WITNESS. Without knowing——

[1–89] The COURT. If you want to put it in the record I will let it go in the record for whatever it may be worth, if anything.

A. Without knowing the amount of effort involved I couldn't make a statement on that.

Q. All right.

Do you have an opinion as to whether or not the snail darter would be able to successfully to reproduce in the Hiwassee River transplant area?

A. Again I think that would be highly marginal.

Q. Highly marginal?

A. Yes.

Q. And upon what do you base that opinion?

A. Lack of an analogous substrate in the Hiwassee River compared to the natural habitat in the Little T. Very low percentage of comparable habitat.

Q. You say very low percentage of comparable habitat, specifically what are you referring to?

A. The type of gravel shell that you find in the Little T, clean swept, interspersed with clean swept sand and a great extent of it, a mile and a half of it at Coytee Springs, for example, and just a few hundred feet at a couple of places in the Hiwassee. That I am familiar with.

Q. But yet from your observations of the East [1–90] Tennessee area, is the Hiwassee River the closest area that has any analogy to Little Tennessee River?

A. It is second best I feel, yes.

Q. Now, Mr. Starnes, have you actually been able to observe any reproduction activity in the Little Tennessee River?

A. Yes, I have.

Q. And where have you specifically observed that in the Little Tennessee?

A. Two hundred yards below the mouth of Coytee Springs.

Q. And when did you specifically observe that?

A. April 17th.

Q. 1976?

A. Yes.

Q. And have you observed that sort of activity on any other occasion in the year 1975 or 1976?

A. No, I have not.

Q. And on the occasion when you observed it on April 17, 1976, did you actually film that particular activity?

A. Yes, I did.

Q. And you are prepared to present that film for His Honor yourself?

A. Yes, I am.

[1–91] Mr. DOUGHERTY. Your Honor, at this time we would propose to show a short three minute film, approximately——

The COURT. All right.

Mr. DOUGHERTY. And Mr. Starnes maybe could stop at points and explain it to the extent it needs explanation.

I would offer it as an exhibit with this one comment, if I might, Your Honor.

This is the only copy of this film available and Mr. Starnes needs it for his doctorate dissertation. Is it possible we could introduce it as an exhibit with the right to substitute a copy and withdraw the original?

The COURT. Yes, without objection you may do so.

Get the lights off.

By Mr. DOUGHERTY:

Q. Now what is the approximate depth that these movies were taken?

A. Two and a half feet.

Q. If there is a point you indicate that you feel you should stop it, if you will so indicate.

[The movie was shown, during which the witness made the following comments:]

[1–92] The WITNESS. It will be clearer in a minute but this is the male laying here. This is the female immediately in front of him.

There is quite a bit of preliminary courtship, whatever, between them before——

Mr. DOUGHERTY. If you will speak up.

The WITNESS. At this speed it is going to take a minute.

The female is here. You see a male moving into position along the side.

He is now lying immediately behind her here, the female.

She is a lot more worried about me being there than he was. He was much more intent on what he was doing.

He is lying beside her, a tail wagging movement to get her attention off of me.

Now he is dropping down on her, coming over her left hindquarter here.

Mr. DOUGHERTY. That is the female you are pointing to and the male is to the lower left?

The WITNESS. Yes. He is back on her right quarter again. You will see him place his left pectorial—he didn't do it here, a crossover maneuver.

[1–93] The left pectoral is over and he is stroking the tail of the body with his pectoral fin, and she moved away this time.

This is either a very heavy courtship or possible spawning, I think, coming up here, I believe.

Moving in unison. She moved away again.

They go through the same maneuver again, moving or stroking her with his left pectoral fin. Crossed back over to the left side again: crossed over to the left.

He is waving the anal fin very violently, moving the sand around for egg deposit.

That is the end of it, you can cut it off.

That was either a very, very heavy courtship or a possible actual spawning.

[End of film.]

Mr. DOUGHERTY. The film will be Exhibit No. 40, Your Honor.

[Exhibit No. 40 was filed.]

By Mr. DOUGHERTY:

Q. Now, Mr. Starnes, the area where you observed that activity, what was the depth again?

A. Two and a half feet.

Q. And what was the situation with regard to the current?

[1–94] A. It was nearly two feet per second which is nearly the swiftest current in the river at that area.

Q. And what was the bottom like with regard to whether it was clean?

A. You can see it was 75 to 80 percent gravel interspersed with clean swept sand.

Q. Did it have any silt on it at all?

A. None whatsoever.

Q. Now prior to the female depositing the eggs, is there any characteristic motion that the female makes when she deposits the eggs?

A. There is usually, at least it has been observed in other darters, a violent quivering of the body—I don't know if that has to do with expelling the eggs from the body or burying the eggs into the substrate or sweeping aside the sand.

Q. And in this particular situation where you were taking these films, did you observe the femal engage in that motion?

A. Two possibilities, yes. The current was very swift and it was hard to hold on and watch.

Q. And the eggs themselves are very small and almost microscopic, is that correct?

A. Not terribly small. A couple or two millimeters in diameter.

[1–95] Q. And is this the type activity that would necessarily precede the actual depositing of the eggs by the female?

A. Certainly is.

Q. Mr. Starnes, in your opinion with regard to your study of the snail darter and your observation on this particular occasion and your experience in this regard, do you have an opinion as to whether or not the activity which is demonstrated in the film is evidence of, first of all, reproductive activity by the snail darter in the Little Tennessee River?

A. No doubt.

Q. I show you a document which is part of your original deposition, it has not been marked, and ask you if that is a Xerox copy of your field notes which you made on April 17, 1976?

A. It is.

Q. Following the taking of these films and making these observations?

A. It is.

Mr. DOUGHERTY. May I introduce that as Exhibit No. 41.

The COURT. It is received.

[Exhibit No. 41 was filed.]

[1–96] By Mr. DOUGHERTY:

Q. Have you also been on many occasions above 411 bridge and observed the habitat area at those locations?

A. Either fishing or surveying, yes.

Q. And do you have an opinion as to whether or not there is suitable habitat area for the snail darter above the 411 bridge, from there to the Chilhowee Dam?

A. I do.

Q. And what is that opinion?

A. I feel there is very little habitat suitable for the snail darter up there.

Q. Upon what do you base that opinion?

A. Drastically different substrate conditions and high competition and predation from a large sculpin population and trout.

Q. In laymen's terms what is a sculpin?

A. Sculpin, that's about as layman as you can get. It's the small fish which is very common in the upper portion of the river, not much bigger than a snail darter which is highly predatious on other small fish and will eat a fish as large as itself almost.

Q. Is it what is known as a bottom or benthos organism?

A. True.

Q. And resides on the bottom of streams and [1–97] rivers like the snail darter does?

A. True.

Mr. DOUGHERTY. I think you may ask him.

CROSS EXAMINATION

By Mr. WAGNER:

Q. Where does the snail darter live, Mr. Starnes, in terms of the river, the bottom of the river, top of the river or where?

A. It is a bottom organism.

Q. A bottom organism?

A. Yes.

Q. About how many people have seen a snail darter in its native habitat?

A. I would say in the neighborhood of less than fifty—thirty to fifty. I have no idea about people I don't know.

Q. Your research indicates that the snail darter will eat anything it can find, doesn't it?

A. No.

Q. It certainly eats more than snails even in the Little Tennessee River, doesn't it?

A. It does.

Q. And your initial thoughts were it was just a snail eater; is that right?

[1–98] A. Predominantly, yes.

Q. And you've found out now that it doesn't eat hardly any snails in the summer.

A. In the summer of 1973 that was true. Last summer there was more snails in the diet.

Q. And the snail darter population in the Watts Bar Reservoir is eating, isn't it?

A. One of them had eaten, yes, the other had not, apparently.

Q. Now you say that the ones you found were in poor nutritional condition. Isn't it a fact that immediately after spawning that they do appear to be emaciated?

A. To some degree, yes.

Q. And that doesn't mean at all that they are poor nutritionally but merely they have just spent their eggs?

A. I would like to point out that the female is very gravid and has not spawned.

Q. Very gravid, what do you mean by that?

A. She was full of eggs.

Q. She was full of eggs?

A. And still skinny.

Q. What about the male?

A. The male was very gaunt.

Q. Was what?

[1–99] A. Gaunt.

Q. What does that mean?

A. Skinny, emaciated.

Q. You did observe the snail darter yourself at four miles below the mouth of the river, did you not?

A. That is true.

Q. In how many feet of water?

A. About twelve.

Q. When you were told about a week ago that TVA biologists had found snail darters in the Chickamauga Reservoir, was your comment "You boys hit the jackpot."?

A. Well, I don't remember.

Q. Did you make some comment that you-all really hit the jackpot?

A. I may have, I don't know.

Q. OK. So you do think that is an important find, don't you?

A. If it's true, yes.

Q. What does that mean to you?

A. What does it mean to me?

Q. Yes.

A. It doesn't mean anything until it's substantiated.

Q. If the snail darter was found in the Chickamauga Reservoir what does that mean to you?

[1–100] If it were found in the Chickamauga Reservoir, then I would say there was a resident population there.

Q. And you know the area that it was allegedly found in?

A. Only from hearsay.

Q. How far is that from the mouth of the Little Tennessee River?

A. I believe it's some eighty-five miles.

Q. Eighty-five miles. Thank you.

Is it your opinion that in completing the Tellico Dam and Reservoir project that TVA and the biologists are doing everythink humanly possible to conserve the snail darter?

A. Within the limits of the problem, yes.

Q. The snail darter is an extremely difficult fish to find, is it not?

A. Reasonably, yes.

Q. OK. We know that it lives there at Coytee Springs, don't we. You have been there several times and haven't been able to find it, haven't you?

A. True.

Q. And you have looked how many hours without being able to find it?

A. Two hours.

Q. So the discovery of one or more species in [1–101] one area could very well indicate a substantial population?

A. You mean specimen or species?

Q. The discovery of one or more specimens in one area could mean a substantial population in that area?

A. It could or it could not.

Q. Now you were involved in the original research proposal that was submitted to TVA, were you not, in December of 1973?

A. True. 1973? Well, I was, yes, whenever it was.

Q. And you were involved in the preparation of it?

A. I was.

Q. And you agreed with everything that's in it?

A. Well, I agree with what was known at that time, yes.

Q. How many different transplant sites does TVA have on the Hiwassee River?

A. Three to my knowledge.

Q. How many have you been to?

A. All of them.

Q. All of them?

A. Yes.

Q. In what connection have you been there, just canoeing over it or——

[1–102] A. Two of them canoeing; one of them I have been to three times.

Q. You have only examined the substrate then in one of the locations?

A. I have seen the substrate in all of them. I have very critically examined only one.

Q. You know, in fact, precisely where the other two transplant sites are but you haven't critically examined the substrate?

A. Not precisely, no.

Q. Initially you did think that the transplant of the snail darter to the Hiwassee River was a good idea?

A. Yes, sir.

Q. And you still think it's a good idea?

A. If the dam is to be completed, yes.

Q. Do you know TVA biologists Charles Saylor and Gary Hickman?

A. I do.

Q. Do you consider them to be experts on the snail darter?

A. In terms of exposure, yes.

Q. You trust their opinions?

A. I do.

Q. With regard to the snail darter?

A. Well, with regard to anything.

[1–103] Mr. WAGNER. That is all.

Mr. DOUGHERTY. Very briefly, in connection with the first exhibit that I introduced through Mr. Starnes, there was an additional page that should be added to that exhibit describing the observations, and if I may attach it.

The COURT. You may do so.

Mr. DOUGHERTY. To exhibit 41. We can staple it at recess.

REDIRECT EXAMINATION

By Mr. DOUGHERTY:

Q. In connection with the dissection of the two specimens that you were given from the Watts Bar Reservoir, did you make some notes with regard to those dissections?

A. Yes, I did.

Q. I show you a Xerox copy, is that a copy of the notes that you made in connection with that dissection?

A. These are they.

Mr. DOUGHERTY. May we introduce that as exhibit No. 42.

[Exhibit No. 42 was filed.]

By Mr. DOUGHERTY:

Q. Mr. Starnes, in connection with the snail darter, if the dam is allowed to be completed and the [1–104] transplant operation in the Hiwassee is not successful, what will become of the snail darter insofar as you know at this point in time?

Mr. WAGNER. We object to this line of redirect examination. It was not opened up on cross-examination.

The COURT. I'm afraid it was. I will let him answer.

I'm not going to spend much time on it though.

Mr. DOUGHERTY. This is the only question I want to ask him.

A. I feel like the reproducing population of the snail darter will be exterminated.

By Mr. DOUGHERTY:

Q. Be terminated?

A. Exterminated.

Q. Exterminated?

A. Yes.

Q. And how long do you think it would be before the snail darter is extinct?

A. Effectively extinct immediately and in actuality within three years.

Mr. DOUGHERTY. That is all.

[1–105] RECROSS EXAMINATION

By Mr. WAGNER:

Q. Just like to clarify that last point. That's with regard to the Little Tennessee River, mile 17 to .5?

A. The whole Little T. The tailwater wouldn't be suitable either.

Q. But it is only with regard to the Little Tennessee River?

A. With regard to the reproducing snail darter population in total.

Q. In the Little Tennessee River?

A. All snail darter population that I know of regardless of, that I feel are reproducing population.

Q. But, of course, the impoundment of the Tellico River would have absolutely no effect on any existing reproducing population in the Chickamauga Reservoir?

A. If there is one, no.

Q. It would have no effect on any living reproducing population in the Watts Bar Reservoir?

A. It could, high up. Could be temperature problems, or whatever.

Q. But none whatsoever——

A. There will be very cold water coming out of the bottom of the Tellico, I would assume.

Mr. WAGNER. That is all.

[1–106] The COURT. That's all.

[Witness excused.]

Mr. DOUGHERTY. Your Honor, at this point I would offer by deposition the tetimony of Dr. Royal D. Suttkus, S-u-t-t-k-u-s, which was taken by the parties on April 16, 1976, and there is—obviously I do not intend to read all of it but there are certain portions I need to read in order to make a proper record and to appraise Your Honor of the situation in connection with this.

The COURT. That is all right.

Mr. DOUGHERTY. Would Your Honor prefer me to read from here?

The COURT. That is all right.

What's his name?

Mr. DOUGHERTY. Dr. Royal D. Suttkus, S-u-t-t-k-u-s.

The initial examination was by Mr. Wagner.

The COURT. Can't you just tell me what is in the deposition and I will accept what you say about it without taking the time to read it; whatever you say about it I will accept.

Mr. DOUGHERTY. I understand that, Your Honor. There are, I wish I could in a very succinct way just tell you the points that are in there.

[1–107] The point is, I would like at least to, as I understand it, if I don't read it into the record it doesn't get into the record.

The COURT. Yes it will. It will be treated, you can file the whole deposition as part of the record, yes.

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Mr. DOUGHERTY. As I understand in terms of the record of the case that the deposition would not be dealt with beyond this Court if there were——

The COURT. Your understanding is erroneous. The whole deposition will be dealt with because I am letting you file the whole deposition, and it will be treated as evidence, that is, the part that is relevant to the issues that are involved in this lawsuit.

Mr. PEDERSEN. We agree that could be done anyway.

Mr. DOUGHERTY. Well, I want to make sure that as far as the Court is concerned it is appropriate.

The COURT. Well, it is appropriate, it is appropriate.

Mr. DOUGHERTY. I think, Your Honor, if I may, with that comment from the Court, just read very short parts. I think that will deal with the issues.

The COURT. All right, if you want to do it [1–108] that way.

Mr. DOUGHERTY. I might add, Your Honor, and I think I can summarize some of these points, the witness is Dr. Royal D. Suttkus who resides in New Orleans, Louisiana, and who is a professor at Tulane University, and is fifty-six years of age.

He has been a professor at Tulane University since the fall of 1950. He is a professor of biology there and did some of his training at Michigan State, and then received his further degrees in zoology and biology at Cornell University where he did some study under Dr. Raney.

Now in that connection, the question was asked his opinion of Dr. Raney, Dr. Raney was an expert who testified for the defendant TVA, and Dr. Suttkus was at one time a student of Dr. Raney, and the question was asked by Mr. Wagner is Dr. Raney an expert in the field of ichthyology, and the point was he was commenting on Dr. Raney as an expert, and his answer was on page 4:

"It depends on what you're talking about, in reference to what. You asked the question whether Raney was an expert. In the forties and fifties when I was a student there. I would say that Raney was one of the leading ichthyologists, fresh water ichtyologist [1–109] in the country, and in recent years I haven't been in touch with him that much, but he has not been active in the society or national society, publications have not appeared in our journals. His activities are away from what they used to be."

Mr. WAGNER. Go ahead and read the next.

Mr. DOUGHERTY. I think you have a right to read anything you want to.

The COURT. While he is on that subject you read what you want to read.

Mr. WAGNER [reading]:

"Q. Let me ask you this Doctor. Has Dr. Raney probably trained as many Ph.D. ichthyologists as any other one person in the United States?

"A. Yes, I would say so.

"Q. Approximately how many has he trained?

"A. Somewhere around forty."

The COURT. All right.

Mr. DOUGHERTY. In connection with that connection, Your Honor, I file a vitae in connection with Dr. Suttkus, and at this time I would like to file as an exhibit the vitae of Dr. Suttkus along with his list of publications as part of the record as an exhibit, if we may.

The COURT. The vitae of Dr. Suttkus.

[1–110] [Exhibit No. 43 was filed.]

Mr. DOUGHERTY. This is on page 41.

By Mr. DOUGHERTY:

"Q. And you have been continuously engaged for the last twenty-five years as a professor of ichthyology at Tulane University and are still engaged at this time?

"A. Yes, and in other courses too.

"Q. All right. With regard to your actual field experience and keping up to date with regard to collections and your areas of concern in fresh water fishes, would you briefly describe that experience? Has it been continuous over the last twenty-five years?

"A. Yes, it has. When I arived at Tulane in 1950 there was no fish collection there, with the remains of a few formal preserved specimens in the old museum. But out of the few specimens that were there, I retained two. There wasn't much in the way of fish, but there were some birds and animals. But essentially since 1950 I have built the fish collection there and personally involved in collecting most of the specimens, and we now have over three million catalogued specimens. This is nearly one hundred thousand catalogued lots which make up

over the three million specimens, catalogued specimens. I am the curator of the vertebrate collections at the Riverside Campus and I have the mammals, birds environmental plans, reptiles and [1–111] amphibians as well as fishes, but the fishes are the main collection that they have, and I have been the curator since 1950 and the only curator of the collection."

Mr. DOUGHERTY. I would like to file the Exhibit 2, a publication prepared by Dr. Suttkus in connection with the Tulane University collection of which he is the curator.

The COURT. Received.

[Exhibit No. 44 was filed.]

Mr. DOUGHERTY. Also found on line 22, on page 42:

By Mr. DOUGHERTY:

"Q. How does the Tulane University fish collection, which you are responsible for and been involved in over the last twenty-five years, compare in size and cataloging of specimens with other fish collections in the United States?

"A. It's one of the three largest, National Museum and University of Michigan. And I consider it to be one of the best curated collections and I don't like anyone telling me and showing me that it isn't, but when I emphasize the point that it's catalogued specimens there are some collections that have tremendous backlogs and this material is not available for study. But we have very little backlog, and, as I say, this material is all catalogued and it's on the shelf. It's available. We have lots of loans, lots [1–112] of exchange."

Mr. DOUGHERTY. Going to page 44, line 21.

By Mr. DOUGHERTY:

"Q. Dr. Suttkus, what experience have you had over the last twenty-five years with regard to darters and specifically darters in the sub-genus Imostoma?

"A. During the last twenty-five years, since I've been at Tulane, I've collected more than twenty-five thousand specimens of the Imostoma group. Percina Ouachitae which is the widest ranging one, and which is an inhabitant of the southern streams closest to me, I have collected between five hundred and six hundred collections, total more than twenty-five thousand specimens. In one site alone in a thirteen year study in the Pearl River System——

"Q. And where is the Pearl River System?

"A. The Pearl River flows from the area of Philadelphia, Mississippi, Carthage, Mississippi, area, down right through Jackson, Mississippi, and then southward into Mississippi Sound area, Lake Pontchartrain area.

"Q. And in that collection, with regard to the Percina Ouachitae, have you engaged in a rather intensive study of that species over a particular thirteen year period?

"A. Yes. Each time that I make collections, I make observations on spawning conditions, if it's at the time of the year, so over the years I know pretty well when [1–113] the Ouachitae spawns, which is January, February in the Pearl River System, and I always check them to see whether they're ripe and indicate this in my notes. And if I make more than one observation, by stripping or just by handling, if they're spawning, actually spawning, the males will run milt and the females eggs; with just a slight squeeze the products come out of their bodies. So, I record this in my notes as to the number of observations that I made. And so over the thirteen year period at this one site, I've made a hundred and twenty-seven collections and in those hundred and twenty-seven collections I've taken over ten thousand, and it's over thirteen thousand specimens of Ouachitae, and during the first two years of this study was making regular monthly collections, and then some intermediate, more than one a month, at the times when spawning occurred."

Mr. DOUGHERTY. Going to line 24 on page 46:

By Mr. DOUGHERTY:

"Q. Now, have you also studied other species within the subgenus Imostoma, other than the Percina Ouachitae?

"A. Yes. The Percina Shumardi is in that same area and the relationships, we say, in abundance there, where we would take anywhere up to a dozen of Shumardi, but it would be hundreds of Ouachitae. Incidentally, at that site, we have a record over the thirteen year period of [1–114] ninety-three species of fishes, not darters, but ninety-three species of fishes."

Mr. DOUGHERTY. Going down to line 17, page 47.

By Mr. DOUGHERTY:

"Q. Dr. Suttkus, to what extent have you engaged in collection and studies of other species within the sub-genus Imostoma, other than the Percina Ouachitae?

"A. I've collected, and I think I referred to it earlier, I've collected Uranidea in the White River System in Arkansas and right on the Arkansas-Missouri line. There it's a matter of several dozen specimens and a number of collections. And I've collected several hundred specimens of Shumardi in most of its range. I've collected in the Wabash in Indiana, in the Arkansas-Missouri area, all the way down the lower Mississippi, and tributaries there in the Pearl, and in the Alabama System, and in the Tennessee System, I've collected Shumardi. Then I've collected the undescribed Imostoma in the upper part of the Alabama System in the Conasauga, and there it's a matter of several dozen specimens that I've collected on a number of different trips.

"Q. Have vou been involved in the collection of the Percina Tanasi in the Little Tennessee River at Coytee Springs on the two occasions in approximately November 1975?

"A. Yes.

[1–115] "Q. To what extent, if any, have you made a study of certain of the darters in the sub-genus Imostoma in situations which involved pre-impoundment and post-impoundment of dams or reservoirs?

"A. I had a ten year study from 1966 to 1976 in the Alabama River. In 1966, this was prior to the construction of Miller's Ferry Dam and Claiborne Dam. In our early—we were making five collections a year at a whole area of sites. Primarily we started out with four sites in which we considered our primary area from River Mile 110 up to 137. This is the area where we actually got samples. And then once a year we would expand and sample over a distance of more than fifty miles, most of this downstream from down to below the, now the site of Claiborne Dam, down to what is called Claiborne Landing. And our earlier collections in this study, we got Percina Ouachitae, at a number of good gravel bar sites. As the alterations went on, the strippings of the banks, the washing of the silt took place into the—the dredging of the channel, the disturbance of removal of gravel out of the bars, our samples just went down to nothing and during the last—I have to be sure, but about the last two years, up until the—one of the last collections we made, one of the last collecting trips, and we got a few Ouachitae specimens at one of the former best sites, but the numbers declined [1–116] completely and then, as I say, we collected these few specimens at this one bar. I don't interpret this as a reestablishment of the species in the impounded area, but that it still is hanging on in some of the tributaries. We have taken Ouachitae in the tributaries, and it is possible still in the area, but its numbers have gone down completely and over dozens and dozens of samples during the ten year period, we haven't taken any where we used to get——

"Q. Did you make any population estimates at the beginning of the study and toward the conclusion of the study?

"A. Just the comparison of our samples, that the form has diminished. Construction has disturbed the areas around the gravel bars which are hard-packed. Now, the species which were found around the gravel bars disappeared even before the Percina Ouachitae and never did reappear again on any of our checks. The disturbance started with the dredging of the channel of the river, the clearance of the banks, and the construction of the locks around the dam. There was a lot of silt that went in the stream then and deposited.

"We also made comparison samples on the opposite side of the river and there would be a bar that had recently been disturbed, which had not been disturbed prior to that, if there was any, and we made comparative samples [1–117] two different times and the lack of species and specimen was just so pronounced that it is obvious to anyone who has experience that disturbed habitat does have tremendous impact on the fishes."

Mr. DOUGHERTY. Mr. Wagner asked a question and then he made a comment, and then the answer on page 50, line 18.

By Mr. DOUGHERTY:

"A. The Noturus Munitus is a catfish, a little catfish, and I'm just illustrating the point that this destruction is not specific to the Ouachitae, but other species declined also."

Mr. DOUGHERTY. And then the answer:

By Mr. DOUGHERTY:

"A. But in comparison of the samples on either side of the river, this was considering all species, bottom species and intermediate level species. The disturbance is noticeable.

"Q. Generally speaking, in that situation, the study of the Alabama River that you refered to, in your opinion what was

the effect of the creation of the impoundment and reservoir and the activities related thereto on the habitat of the Percina Ouachitae in that stretch of river?

"A. It has been a drastic change. The disturbance, [1–118] the dredging of the bars and the removal of the intermediate size—in some places there are piles of cobblestones left, but the intermediate sizes of gravels have been removed, but this continued maintenance of the channel just eliminates the spawning areas, and our sampling has not been restricted to the former gravel bars or the disturbed gravel bars, but we have collected in the other areas as well.

"Q. Has your sampling in that Alabama River area where the reservoir was created also included areas where the, so to speak, bottom areas were not disturbed by dredging?

"A. Yes.

"Q. In your opinion, what has been the effect of the creation of the reservoir and impoundment in the Alabama River situation, which you related, upon the critical habitat of the Percina Ouachitae in that particular river?

"A. Well, it has been decidedly detrimental and has eliminated its habitat to the extent that the population has disappeared.

"Q. In your study of darters and fishes in North America, and particularly the species in the sub-genus Imostoma, to what extent have your observations concluded that the species in the sub-genus Imostoma have essentially the same habitat, and when I say habitat, including within that critical habitat, the area which we would consider [1–119] essential to reproductive activity or spawning?

"A. In my experience, the described ones and the single undescribed one that I know of, they all have a similar spawning habitat.

"Q. And what would you consider the essential elements of that habitat?

"A. This is a gravel bar, packed, not a loose eroding or shifting gravel bar, but a hard-packed gravel bar, with associated sand areas nearby, but the greatest concentrations of spawning I have observed over a gravel or very closely associated to gravel.

"Q. To what extent is current or movement of water in that habitat area also essential?

"A. This is—I don't know whether this is universal, and the word riffle refers to bottom and current conditions. That is, it's moving water; riffle being a somewhat reduced situation from the rapids area. A rapids area may be a bedrock situation or a fast-moving area over gravel and bedrock."

Mr. DOUGHERTY. Moving down to line 21.

By Mr. DOUGHERTY:

"Q. To what extent, in your opinion, was the area which you observed around Coytee Springs at River Mile 7 in the Little Tennessee River illustrative of the habitat which you consider essential for the darters that you have [1–120] observed in the sub-genus Imostoma, including the Percina Ouachitae?

"A. It was similar in that there was a hard-packed gravel bar and there was some larger pieces of rock in some areas with sand in the vicinity and was typical of what I consider to be a spawning habitat for other members. The fluctuation of the water there, however, I consider to be unseasonable, and I don't know, with one observation what effect this might have on it, or impact on it. But as I stated earlier, this population may be under stress at the present time.

"Q. To what extent have you seen or observed or read any scientific evidence or scientific literature with regard to the Percina Shumardi living and reproducing in reservoir areas or impounded areas?

"A. I am not aware of any. I have never observed any. I have never collected any in a reservoir. I have collected some in tributaries to reservoirs, but not in still water.

"Q. In your opinion do you have a considerable amount of knowledge and experience concerning the Percina Shumardi?

"A. I would say so. I've collected over most of the streams, as I say, the Wabash River in Indiana, in Arkansas and Mississippi and Texas, Louisiana, Alabama.

[1–121] Q. Covering the last twenty-five years?

"A. The last twenty-five years.

"Q. Dr. Suttkus, you have personally examined the species which has been described as the Percina Tanasi not only physically, but you have read the literature to date about it; you have discussed it among your colleagues, and I believe you have read the document dated January 22, 1976, by Dr. David A. Etnier before the proceedings of the Biological Society of

Washington, describing the species Percina Tanasi. Do you have an opinion as to whether or not this Percina Tanasi is a new and distinct species?

"A. I accept his description.

"Q. Dr. Suttkus, what significance would there be, in your opinion, on the observation, let's say, of the Percina Tanasi, the darter within the sub-genus Imostoma, in the area of the Little Tennessee River adjacent to the mouth of its confluence with the Watts Bar Reservoir in water depths of, say, twenty to twenty-five to twenty-seven feet and the proximity of that particular area to sandy, gravel substrate areas?

"A. That it is close to gravels and—that it is in close proximity?

"Q. Yes.

"A. I don't think it would be anything unusual to expect. I don't know how deep they go, but if the [1–122] observation was made they were spawning there, that would be additional information, but just to be observed or collected from those depths, I don't see that it has a great deal of significance.

"Q. Would you, aside from observing, let's say, the Percina Tanasi at a depth of twenty-seven feet in an area of water, what significance or what importance would you place on the necessity of knowing also the description of the adjacent areas, is really what I'm trying to ask you.

"A. It would be very important to know what the adjacent areas are and how far away the spawning areas were, the observed spawning areas, or the areas where the greatest numbers had been observed."

Mr. DOUGHERTY. Page 57, line 21.

By Mr. DOUGHERTY:

"Q. Assuming in the area of the Little Tennessee River we have certain bank clearing operations and in addition thereto the construction of the dam, concrete dam structure itself at, say, approximately River Mile .5 in the Little Tennessee River itself, along with a coffer dam, what, in your opinion, could be the effect of that that you described as stress with regard to finding darters such as the Tanasi downstream in the Watts Bar Reservoir, let's say at locations fifteen hundred yards below the confluence of the Watts Bar Reservoir and the Little Tennessee River or a [1–123] location four miles downstream and a location ten miles downstream?

"A. It may indicate that individuals of this form are seeking new places to live. I don't know as to how far, what the mobility is of Tanasi. I really don't know the mobility of, let say, any species. I can't give you exact figures of how far they range. I'm not talking about anadromous forms, talking about specific salmon going a thousand miles upstream for spawning, but for species to—individuals of a particular species to seek out new places to live, this may be a result of stress within an area. I'm basing this on my observations in the Alabama River. They think that the Percina Ouachitae has, let's say, a limited amount of mobility to move around and seek new areas. The little catfish that I mentioned, Noturus Munitus, it has the least mobility of those two species, and then another one, the crystal darter, it's a larger form and I think it has much greater mobility than the catfish and somewhat greater than the Percina Ouachitae. And in some of our collections and observations, we have taken crystal darters in small tributaries in the Alabama System where we had never taken before and we have sampled in those areas. I think this is a matter of this form seeking new places to become established. So, I think that this may indicate that that has happened. Of course, I can't prove it, but that may be [1–124] the reason for these individuals going down into, dropping downstream. It may be a normal seasonal—I don't know that either."

Mr. DOUGHERTY. Going down to line 23.

By Mr. DOUGHERTY:

"Q. Assuming further, Doctor, that when the Tanasi is examined in the Little Tennessee River at Coytee Springs, for example, at the same time of year, that they are much more nutritionally healthy and the organisms that are usually found in stomach contents are much more in number and substance.

"A. Then I would say that would be very significant and would support an idea that they're under stress in this other—That's why I asked what time of the year, because these—restricted to the Imostoma group, after spawning, when spawning is completed, and you can tell the stage, say, in the latter part of the spawning, you can examine males and females and the males ripen first and then they're spawned out earlier. Their bellies become concave. They have a concave contour to them at the end of spawning. And so they are in, what looks like an

emaciated state immediately after spawning. Now, if spawning occurs in January and February, then by March, or if you have comparable samples from this nearby area and they're in good condition, then I think it is significant that these are [1–125] not in good, healthy condition.

"Q. Dr. Suttkus, based upon your observations of the Little Tennessee River, particularly at Coytee Springs, River Mile 7, and your knowledge and experience in the field of ichthyology, and specifically in fishes of North America, and also your experience in the field of darters, and specifically the sub-genus Imostoma, including therein your study of the Percina Ouachitae in the Alabama River, do you have an opinion, and if so, what is that opinion, with regard to whether or not the closure of the Tellico Dam and the creation of the Tellico Reservoir and impoundment will destroy the snail darter habitat in the Little Tennessee River?

"A. Yes, I would say that it will be.

"Q. Destroyed?

"A. Yes.

"Q. And what would be the basis for that opinion?

"A. The change in the habitat to an impounded situation, the changing of the deposition, the changing of the substrate, the surface of the substrate. The spawning area is going to be—any one of the areas, but the spawning area will be the critical one and when this is reduced or completely destroyed, as far as the success of spawning, then—What the population level has to be to maintain the species, this I don't know, but I think a reasonable [1–126] prediction, that if the spawning habitat is destroyed that it would be a matter of whatever we would say is the life span of this species, individuals of this species, that would be approximately the time that it would take to disappear from the scene.

"Q. I believe you viewed the transplant site, or one of the transplant sites in the Hiwassee River, did you not?

A. Yes.

"Q. Assuming, Dr. Suttkus, that the only evidence of reproduction is the finding of two larvae or Ichthyo Plankton from the percid family, and there is evidence of at least one other member of the percid family in the Hiwassee River, in your opinion is that any evidence of successful reproduction of the transplanted species?

"A. No. This is not any evidence, not any good evidence, but there are more than one other species of percid in the Hiwassee.

"Q. And you base that on your own experience?

"A. Yes.

"Q. And what other species of the percid family are there in the Hiwassee River?

"A. There's Etheostoma Rufilineatum, R-u-f-i-l-i-n-e-a-t-u-m.

"Q. And have you collected that species in the [1–127] percid family in the Hiwassee River yourself?

"A. Yes.

"Q. Can you tell me any other species in the percid family that you have collected or observed in the Hiwassee River?

"A. I don't have a list of species, but I'm sure there are others there. I've got so many localities in mind, but I know that Rufilineatum is there. Zonale is there.

"Q. Could you give me that again?

"A. Zonale, Z-o-n-a-l-e.

"Q. That's another member of the percid family?"

Mr. DOUGHERTY. Going down to line 11:

By Mr. DOUGHERTY:

"Q. Do you have records of this?

"A. Yeah."

Mr. DOUGHERTY. And then he was asked to file an exhibit in connection with the other collections that he had made in Hiwassee River, and this was forwarded to us and we agreed this can be introduced as Exhibit No. 45.

[Exhibit No. 45 was filed.]

Mr. DOUGHERTY. Indicating, Your Honor, that he had collected himself in the Hiwassee River at least three other specimens from the perch or Percid [1–128] family.

Your Honor, we would ask that the deposition of Dr. Suttkus be filed.

The COURT. It will be filed.

Mr. WAGNER. Your Honor, with the understanding that the deposition is being filed, we would just like to summarize a couple of points. I will be quite brief.

Dr. Suttkus, of course, is from New Orleans. The only contact he has had with the Little Tennessee River, he has been here twice and that was the date that CBS news was here and he made collections there.

He has never made any collections in the Watts Bar Reservoir, Chickamauga Reservoir, and the various surveys and so forth that they were talking about was with regard to other darters, or all with regard to other darters and not with regard to the snail darter.

The COURT. All right.

It is five minutes after 12:00. I guess we had better recess until 1:20.

[At 12:05 p.m., court recessed until 1:20 p.m.]

[1–129] AFTERNOON SESSION

[At 1:20 p.m., court reconvened pursuant to the noon recess, when the following proceedings were had:]

The COURT. All right, Gentlemen, you may proceed.

Mr. DOUGHERTY. Your Honor, at the outset, I would like to ask a question, if I may. We have a witness who is an economist, will probably only be used in rebuttal, and I would ask permission of the Court if he could sit in the courtroom. He is only a rebuttal witness and would not be a witness as to the merits or the facts.

The COURT. Any objection to that?

Mr. PEDERSEN. We have no objection, Your Honor.

The COURT. All right, he may sit in.

Mr. DOUGHERTY. Thank you.

Your Honor, at this time I would like to introduce two exhibits that have not been previously introduced. They both have been marked, both of them are provided by the defendant, TVA.

One is a document which is a list of all water courses, rivers, lakes, what have you, that [1–130] TVA has searched for the snail darter and has been able to find any, and we would ask to introduce that as Exhibit No. 46.

[Exhibit No. 46 was filed.]

Mr. DOUGHERTY. I would also like to introduce another exhibit furnished by TVA which has been marked, which was prepared by the defendant in connection with the various water levels of the Little Tennessee River now and the levels that will exist at various stages along the Little Tennessee River after impoundment, if such occurs, if we may introduce this as Exhibit No. 47.

The COURT. Received.

[Exhibit No. 47 was filed.]

Mr. DOUGHERTY. Is Your Honor ready for me to proceed?

The COURT. Yes.

JOHN S. RAMSEY, called as a witness by and on behalf of the plaintiffs, after having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

By Mr. DOUGHERTY:

Q. Please state your full name for the Court?

[1–131] A. John S. Ramsey.

Q. And what is your age, Mr. Ramsey?

A. Thirty-seven.

Q. Where do you live?

A. 425 East Magnolia, Auburn, Alabama.

Q. And I believe you are a professor at the Auburn University?

A. Through courtesy my employer is the U.S. Fish and Wildlife Service. My correct title is Unit Leader, Alabama Cooperative Fisheries Research Unit at Auburn University.

Q. And in that connection you do teach courses at the University?

A. I do.

Q. Auburn University.

A. I do.

Q. In the field of ichthyology?

A. Yes.

Q. You are also specifically employed by, will you give us that again, please, for the record?

A. U.S. Fish and Wildlife Service, Department of the Interior, at a research station called the Alabama Cooperative Fisheries Research Unit.

Q. You are in essence an employee of the Department of the Interior of the United States Government?

[1–132] A. Yes.

Q. And how long have you been so employed?

A. Nine years.

Q. And what is your specific function as an employee of the U.S. Fish and Wildlife Service with the Department of Interior?

A. To conduct research on fishes and fisheries and their habitats, to train students, and to help educate students at Auburn University.

Q. And in this function you really have a dual purpose, teaching at Auburn University and engaging in research activities for the U.S. Fish and Wildlife Service?

A. That's right.

Q. Will you briefly, Dr. Ramsey, relate your educational background?

A. A bachelor's degree at Cornell University in 1960; Ph. degree, Ph. D. degree at Tulane University, 1965.

I was employed following that at the University of Puerto Rico in marine biology for two years. In 1967 I came to Auburn.

Q. And have been there ever since?

A. That's right.

Q. Your field is ichthyology?

A. Yes.

Q. And this has been your professional area of [1–133] expertise since your Ph. D. degree?

A. Yes.

Q. Have you been involved in a classification of new and undescribed species yourself?

A. I have.

Q. How many species have you specifically described or classified yourself?

A. In published form two.

Q. And have you engaged in active publication yourself?

A. I have.

Q. Actively, particularly over the last nine years?

A. Perhaps averaging three publications a year.

Q. And do you also engage in active field work?

A. I do.

Q. In the course of your activities?

A. Yes.

Q. Have you had experience in your employment with the U.S. Fish and Wildlife Service with darters?

A. Yes.

Q. Have you also been to the Little Tennessee River area and specifically engaged in the collection of the snail darter?

A. I have.

[1–134] Q. And on how many occasions?

A. One.

Q. And I believe that was with Dr. Etnier, is that not correct?

A. That is right.

Q. I believe one of your professors at the time when you went to Tulane University was Dr. Suttkus; is that not correct?

A. That is correct.

Q. And is Dr. Suttkus considered an authority in the field of darters in the United States?

A. He is.

Q. Is there anyone in the field of ichthyology in the United States who has had more involvement and experience with darters than Dr. Suttkus?

A. I would say no one has more experience.

Q. And does not his experience span a good part of the United States and not just the southeastern part of the United States?

A. It does. Dr. Suttkus is unusual in having over 6,500 personal fish samples in his background all over the United States with emphasis on the eastern United States, amounting to over 12,000 hours of observation of fishes in their habitats.

Q. When was the occasion that you engaged in the [1–135] collection of the snail darter on the Little Tennessee River?

A. It was in late February this year.

Q. 1976?

A. That's right.

Q. And did you have occasion on that trip to see and collect specimens of the snail darter?

A. Yes. We encountered two.

Q. Have you also had occasion to read the scientific paper prepared by Dr. Etnier in connection with his description of this species called Percina imostoma tanasi?

A. Yes.

Q. Do you agree with the scientific community that this is a new and distinct species?

A. Yes.

Q. Within the subgenus of imostoma?

A. Yes.

Q. You also agree that the closest relative is the Percina uanidea?

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A. I do.

Q. Generally speaking, Dr. Ramsey, is it fair to state that the habitat area for darters is that where we have a clean gravel substrate bottom area of a river with some current involved?

[1–136] A. The snail darter in particular?

Q. Yes.

A. Yes.

Q. And did vou observe that specifically when you collected the snail darter at Coytee Springs in the Little Tennessee River?

A. Yes.

Q. Dr. Ramsey, based upon your experience as an ichthyologist and with darters and specifically your observation of the snail darter itself, do you have an opinion as to whether or not the closure of the Tellico Dam and the consequent creation of the Tellico Reservoir and impoundment will jeopardize the continued existence of the snail darter and destroy or modify its critical habitat in the Little Tennessee River?

A. I concur with that and indicate that the strongest population, at least as far as my observation is concerned and what I have seen in the literature, would be inundated by the proposed closure of the proposed project.

Q. And when you say inundated do you mean terminated or exterminated?

A. The habitat would be changed. It would not be exterminated of course, it would be changed.

The impoundment of that lake would increase the water depth, slow down the current and allow sedimentation, [1–137] or sediment to accumulate on what now is rather clean gravel substrate.

It would, in addition, enable the predators, which are now largely excluded from this shallow ripple type habitat, or non-type habitat, would enable them free access to the darters.

The darters themselves as individuals likely would continue to live under the reservoir; however, I rather doubt they would reproduce there and, in addition, presumably would be picked off by predators one by one. We have seen this in other reservoirs in the southeast. They will survive but will gradually disappear.

Q. And when you say gradually disappear over the life span of those that remain, then if they are not able to effectively reproduce will they eventually become extinct in that area?

A. They would be extirpated in that area, yes.

Q. What is the basis for your opinion that the inundation with the impoundment would in essence destroy the habitat or modify the habitat of the snail darter in the Little Tennessee River?

A. I am sorry, would you repeat that?

Q. What factors with regard to the creation of a reservoir would modify or alter the habitat adversely for the snail darter so that it could not effectively reproduce [1–138] in the Little Tennessee River after impoundment?

A. The previous statement on changes I think would cover the ground. The main thing being that it's doubtful that behaviorally they would go ahead and spawn in the deep reservoir habitat. I would say it would depend on the influence of current.

Q. If the area, for example, at Coytee Springs were instead of two and a half feet to, say, five feet were something like forty feet in depth or in excess thereof, would this support the opinion that vou have just expressed?

A. That would be conjectural. I would say that it is unlikely it would spawn in forty feet of water without the current.

Q. And what is the effect of the silt, increased silt in the area of clean gravel substrate on the bottom as far as reproduction is concerned?

A. The eggs themselves would be covered—in the first place, I would say, the eggs unlikely would be deposited in silt substrate, and if they were deposited in the silty substrate probably would not adhere as readily and would eventually be washed and picked off by egg-eating organisms below.

And then secondarily, with continuing siltation the eggs themselves would be covered if they adhered and presumably suffocated.

[1–139] Q. Would your opinion in any way be altered if we assume that approximately eight specimens were found below the confluence of the Watts Bar Reservoir and the Little Tennessee River, three of which were in the area of a thousand or fifteen hundred feet below that confluence, another specimen at four miles downstream and approximately four additional specimens ten miles downstream?

A. Possibly would be altered. That would require additional information on whether these are what we call doing well in the area, that is, are robust, healthy individuals, and I would like

to see information on whether they are known to be spawning in this area.

Q. There would have to be some evidence that there was reproductive activity successfully engaged in in those areas of Watts Bar?

A. It would. I would like to know something more about the habitat in general. Where you see in many instances the darters and other organisms as well, you will see strong populations in one area of feasible habitat, that is, an area of concentration, however, you will also many times observe marginal populations just hanging on and in some instances I have seen myself where they are not there every year, just there by chance, possibly not through chance—I shouldn't say through chance, but they are there one year and possibly through recruitment from [1–140] upstream and then they fail to reproduce and disappear. I have seen this in one other instance in the Tennessee Valley.

Q. From the information you have been provided, at the very least, the significant or major portion of the range of the habitat of the snail darter is the Little Tennessee River, is that not correct?

A. Yes.

Mr. DOUGHERTY. I believe you may ask him.

CROSS-EXAMINATION

By Mr. PEDERSEN:

Q. Dr. Ramsey, you do not profess to be speaking on behalf of the U.S. Fish and Wildlife Service, do you?

A. That is correct. I am here as an individual.

Q. You are appearing in your own individual capacity?

A. In individual capacity as an ichthyologist, yes.

Q. These views are your own?

A. Yes, sir.

Q. Now in your deposition which was taken for discovery purposes on the 30th of March, 1976, I believe you said that you were opposed to the Tellico project; is that correct?

[1–141] A. What were my words in that?

Q. I am just asking you if you were opposed to the project. I think that question is self-explanatory. Answer: "OK. I am opposed to the project."

A. Yes, I stated that with reference to its effect on the snail darter.

Q. Well, is that the only reason you are opposed to it?

A. That is the only reason I am capable of addressing.

Q. Otherwise you think the project is all right, is that what you are saying?

A. I am not saying that, necessarily.

Q. Well, I don't—I am not going to say whether you said yes necessarily or not. Is that what you are saying?

A. Well, my expertise here is the subject at hand, as I understand it. Other than that my response would be as an individual which I am not convinced is what this Court wants.

Q. No, but it's what I want. I want to know if you are opposed to the Tellico project?

A. OK. I am opposed to the Tellico project because I feel the end or extermination of the snail darter.

Q. Is that the only reason you have for being [1–142] opposed to it?

A. That's the only reason I really feel I am qualified to oppose it.

Q. In that deposition, Dr. Ramsey, I asked you this question——

Mr. DOUGHERTY. Would you please tell me what page you are referring to?

Mr. PEDERSEN. Page 13, line 15.

Mr. DOUGHERTY. Your Honor, I don't think that's the proper way of doing it. He should ask him——

The COURT. I don't know. Let him do it. I will determine that. I will determine whether it is proper.

By Mr. PEDERSEN:

Q. You were asked this question——

The COURT. Don't interfere with him, now, Mr. Dougherty.

Mr. DOUGHERTY. I am not trying to interfere, Your Honor.

The COURT. Don't interfere while he is cross-examining this witness.

Mr. DOUGHERTY. I am trying to make a point.

The COURT. And if he asks a question that you think is improper, then you make your objection to [1–143] it and state your reason and the Court will pass on it. But let's handle this in an orderly manner.

By Mr. PEDERSEN:

Q. I asked you at that time: "Do you feel, Mr. Ramsey, that the project should be halted even though Congress thinks that it should go forward?"

Mr. DOUGHERTY. Your Honor, may I object. I think he has gone into that, I think he has asked him about it and the man has given him——

The COURT. I am not going to sit here and let you go into detail. I will let him answer that question for what bearing it may have on him as an interested witness or a disinterested witness, and the objection is overruled with that explanation.

Go ahead. Let's get along, Gentlemen, don't take up time on things like that.

The WITNESS. Please, would you repeat that question?

By Mr. PEDERSEN:

Q. Be happy to.

"Do you feel, Mr. Ramsey, that the project should be halted even though Congress thinks it should go forward?"

A. I understand that the Endangered Species Act of 1973 stands, and on this basis I think that the dam [1–144] should be stopped.

Q. You are well aware of the fact, of course, that Congress also authorized the project, are you not?

Mr. DOUGHERTY. Your Honor, I think that——

The COURT. That's enough of that, Mr. Pedersen. I don't want to hear any more on that.

Mr. PEDERSEN. Very well, All right.

By Mr. PEDERSEN:

Q. How many species of animals exist on the earth today, Dr. Ramsey?

A. Somewhat over a million, 1.2 million.

Q. 1.2 million, and how many have existed in the past that no longer exist?

A. I can't say. I would say at least that many.

Q. I believe you stated that there were several million, on your deposition?

A. Well, I don't know how many millions there were but many, many. I would say that.

Q. Many, many millions. Now when you spoke of discovering a new species, just explain what that means? Does that not simply mean that you are classifying and describing an animal that did exist but nobody else actually took the trouble to give a scientific description to?

A. I would say that when we indicate we have discovered a new species, we are saying we are making it [1–145] known to science that, first informally and then through formal publication. This is not saying that the American Indians haven't seen the thing before.

Q. Yes. It could have been seen by millions of people, as a matter of fact, but no scientist actually——

A. That is right.

Q. Actually went to the trouble of classifying it and describing it; is that correct?

A. That's right.

Q. Now to do that type of classifying it's what you call taxonomy, is it?

A. Yes.

Q. You don't have to have a Ph. D. degree for that, do you?

A. No, sir.

Q. Nor a master's?

A. No.

Q. About how many new species are discovered or described each year throughout the world?

A. All animals?

Q. Yes.

A. All organisms?

Q. Of all animals, yes.

A. I don't know. I imagine with insects and the rest it is perhaps several thousand.

[1–146] Q. Several thousand?

A. Yes.

Q. Have you discovered some new ones yourself or classified some, you said?

A. Yes.

Q. So there isn't anything particularly new or unique about that, is there?

A. It is unique in that organism has been encountered and recognized and this is where a scientist's view is of interest because a layman collecting this fish may have a name for it but he may not have its status in mind.

Q. I see.

A. So our function is that of communication. Besides initial discovery our function is that of communication to bring forth new findings as is the responsibility of any scientist.

Q. Now you were asked about the significance of finding the snail darter ten miles down the Watts Bar Reservoir below the Little Tennessee River, and did you say that was significant or not significant?

A. What was my wording on that?

Q. I am asking you now, was that not a significant or very significant thing?

A. I believe the context was would I be surprised to learn of its existence ten miles below the mouth of the [1–147] Little Tennessee River, and I said without much knowledge of the lake itself I would be surprised.

Q. And would you consider it significant?

A. Significant.

Q. Would you consider it very significant?

A. It's significant. Very is not a useful word.

Q. It doesn't add anything to it?

A. Yes.

Q. If I say that you are very handsome that doesn't help you feel any better. All right.

You certainly cannot say, can you, Doctor, that it will not be found in many more reservoirs?

A. I can't say it will not be found elsewhere.

Q. Yes, or in reservoirs?

A. In reservoirs.

Q. Yes.

A. I can say it's improbable that it will be found in strong populations.

Q. Would it be significant if it were found, say, beyond down below Watts Bar Reservoir in the Chickamauga Reservoir?

A. The finding of any population is significant.

Q. Suppose it were found in the Chickamauga Reservoir eighty-five miles below the Little Tennessee River, would that be significant?

[1–148] A. Certainly would.

Q. Highly significant?

A. Be highly significant.

Q. Highly significant, all right.

There has been testimony introduced here, Dr. Ramsey, to the effect that such a finding would indicate that the darter

would reproduce and live and survive there, do you agree with that?

A. It is possible that it will reproduce and survive there.

Q. Yes, and you think that is strong evidence of that, do you not?

A. I don't know anything about that population.

Q. Well, do you know enough about the reservoir, about the reservoirs on the Tennessee River where this creature is involved and about the snail darter, would you not know enough to have an informed expert opinion as to whether——

The COURT. Mr. Pedersen, I'm afraid your question is much, much longer and much more involved than the answer would be.

Try to make your questions in one sentence, if you can.

Mr. PEDERSEN. Well, all right.

Mr. DOUGHERTY. It is very long, Your Honor.

By Mr. PEDERSEN:

Q. Do you know enough about the Chickamauga Reservoir and the snail darter to know that if it is found in the Chickamauga Reservoir that is good evidence it will reproduce and live in the Chickamauga Reservoir?

A. I don't know much about the Tennessee Valley reservoirs.

Q. I see. How many species of darters are there, Dr. Ramsey?

A. There are over a hundred. I would estimate one hundred twenty.

Q. You stated in your deposition about one hundred thirty. Do you think that perhaps was in error?

A. In that neighborhood. I couldn't find a source and make a count and determine which species are undescribed and give an exact figure, but I think it will be close enough for present purposes.

Q. I believe you also stated in your deposition that TVA transplant program was a good program, right?

A. It is.

Q. I believe you also stated that the dam on the Little Tennessee above the Tellico project made the water cleaner and cooler than it was before the dam; is that true?

A. That is right.

[1–150] Q. Would the dams on the main stream have the same effect on the water; you feel the water in the reservoir

is clearer and cooler, cleaner and cooler than it was before the dam exists on the main Tennessee?

Mr. DOUGHERTY. Your Honor, I think that incomplete unless we consider what industries or communities——

The COURT. I don't know. Do you object to it?

Mr. DOUGHERTY. I do on that basis because the question is not——

The COURT. The objection is overruled.

Mr. DOUGHERTY. The question does not contain sufficient facts.

The COURT. The objection is overruled.

A. With regard to the word before, I would say before advent of the European colonization I would say be similar to the habitat at that time; however, following the advent of agriculture in the Tennessee Valley and associated stripping of the land cover, I would say without a doubt that the impoundments on the Little Tennessee have improved the main channel habitat relative to, say, 1900.

Q. Yes. My question was beyond that. Now going from the Little Tennessee to the Big Tennesee, would the series of dams on the Big Tennessee also make the water [1–151] there cleaner and cooler than it was in a state of nature?

A. My exposure to these in Alabama suggest that. I would have to say that they haven't had as significant an effect as have the dams on the Little Tennessee. The Tennessee lakes in Alabama are highly turbid and a good bit of sedimentation and I would not say these are necessarily improved.

Mr. PEDERSEN. No further questions.

Mr. DOUGHERTY. One question, Your Honor.

REDIRECT EXAMINATION

By Mr. DOUGHERTY:

Q. Aside from the fact that Mr. Pedersen asked you about a number of species of animals and fish and this sort of thing, how many species of darters have been listed as endangered species under the Endangered Species Act?

The COURT. Well, the Act speaks for itself, and we don't need testimony on that.

Mr. DOUGHERTY. The only point I am making, Your Honor, is that I didn't object for the purpose of the record but I think the question——

The COURT. Let's not take up time with questions like that. They don't add anything to the lawsuit.

Mr. DOUGHERTY. I think in terms of Mr. [1–152] Pedersen's comment about all these other species the key thing that this particular snail darter has been listed as an endangered species when all these others have not.

The COURT. Tell us if you want to. Don't take up time with questions like that, Mr. Dougherty. They don't add anything to the lawsuit.

By Mr. DOUGHERTY:

Q. Dr. Ramsey, if you would answer that question.

A. Very small number. I think that three. I would have to check the official list.

Q. One of those is the snail darter?

A. Yes.

Mr. DOUGHERTY. That is all. Thank you, Doctor.

The COURT. That is all.

[Witness excused.]

DR. JAMES D. WILLIAMS, SR., called as a witness by and on behalf of the plaintiffs, after having been first duly sworn, was examined and testified as follows:

The COURT. Do these Doctors come into court without coats? [1–153] Mr. DOUGHERTY. Pardon?

The COURT. Do these Doctors come into court without coats?

Mr. DOUGHERTY. Apparently so.

The COURT. We have a rule that professional men don't come into court without coats.

Mr. DOUGHERTY. I understand that, Your Honor. I was not aware that he didn't have a coat.

The COURT. Do you want me to waive it as to him?

Mr. DOUGHERTY. Would you, please?

The COURT. Yes, I will.

Mr. DOUGHERTY. I think he came from Washington, Your Honor, without a coat.

The COURT. You mean Washington, D.C.?

Mr. DOUGHERTY. Yes.

The COURT. Well, that's typical of Washington.

DIRECT EXAMINATION

By Mr. DOUGHERTY:

Q. Will you state your name for the record, please?

A. Dr. James D. Williams, sir.
Q. And what is your age?
A. Thirty-five.
[1–154] Q. And where do you reside?
A. 2318 Hilda Rose Drive, Silver Spring, Maryland.
Q. And by whom are you employed?
A. U.S. Fish and Wildlife Service.
Q. And that is with the Department of the Interior, United States Government?
A. That is correct.
Q. And within the U.S. Fish and Wildlife Service are you specifically engaged in a division of the U.S. Fish and Wildlife Service?
A. Yes, I am, in the Office of Endangered Species.
Q. And how long have you been employed by the Office of Endangered Species?
A. Approximately two years.
Q. Is it a fair statement that you are the ichthyologist for the Office of Endangered Species with the Department of Interior?
A. That is correct.
Q. U.S. Fish and Wildlife Service?
A. That is correct.
Q. And you are the individual that was involved on behalf of the Department of the Interior in preparing the listing of the snail darter as an endangered species pursuant [1–155] to the Endangered Species Act?
A. That is correct.
Q. Were you also the individual who prepared the documentation with respect to the critical habitat for the snail darter, namely, river mile .5 to river mile 17 of the Little Tennessee River?
A. In drafting the document for critical habitat from river mile 4 to 17.
Q. Now, Dr. Williams, will you briefly relate your educational background?
A. Yes.
I attended high school in Alabama, from there I graduated from high school in south Georgia Academy, from there I attended Middle Georgia College one year, then moved to the University of Alabama where I earned my BS and master's and Ph. D.

Q. And how long have you had your Ph. D.?
A. Since 1969.
The COURT. Did you get a degree in football there at Alabama?
The WITNESS. Yes, sir.
Q. And your Ph. D. is in the field of ichthyology?
A. That is correct.
Mr. DOUGHERTY. Your Honor, I have Dr. Williams' vitae with his list of publications, if I [1–156] may file that as an exhibit to his testimony.
The COURT. Received.
[Exhibit No. 48 was filed.]

By Mr. DOUGHERTY:

Q. As represented in your vitae you are a member of a number of professional societies, are you not?
A. That is correct.
Q. And you have considerable work experience, both in the field and in the field of teaching as an ichthyologist?
A. That is correct.
Q. And where was your last teaching job prior to going to Washington to be employed by the U.S. Fish and Wildlife Service?
A. I was at Tuskegee Institute, Tuskegee, Alabama.
Q. I believe you have also taught at the University of Alabama?
A. That is correct.
Q. Mississippi State College for Women?
A. That's correct.
Q. Belmont College in Nashville, Tennessee?
A. That is correct.
Q. I believe it is also correct, is it not, that you have engaged in the description and classification of [1–157] certain new and distinct species yourself; is that not correct?
A. That is correct.
Q. And one of these classifications you are engaged in with Dr. Etnier?
A. That's correct.
Q. I believe you have known him professionally for several years?
A. That's correct.

Q. I believe it is also correct, is it not, Dr. Williams, that with regard to—may I approach the witness, Your Honor—with regard to Exhibit 33, which I hand you, that being a letter from the Department of the Interior dated April 27, 1976, and signed by Mr. Nathaniel P. Reed, Assistant Secretary for Fish and Wildlife and Parks, that you personally delivered this letter to Mr. Plater which was in response to his letter of April 22nd?

A. That is correct.

Q. And I believe you personally observed Mr. Reed execute the letter and deliver it to you?

A. That's correct.

Q. It is fair to state that you are not here to testify from a policy point of view on behalf of the Office of Endangered Species, U.S. Department of Interior?

A. That's correct.

[1–158] Q. And in that connection you would refer the Court to the letter designated Exhibit 33?

A. That is correct.

Q. But you are here to testify as an ichthyologist and in your relationship with the Office of Endangered Species and in listing the critical habitat?

A. That is correct.

Q. Dr. Williams, in your involvement with the listing of the endangered species and the designation of critical habitat for the snail darter, was this followed in professional fashion?

A. Yes, it was.

Q. And was consultation requested from all of the agencies and other interested parties involved?

A. That's correct.

Q. And did TVA submit comments to your office in connection with the listing and the critical habitat designation?

A. That is correct.

Q. And have you not been involved in communications with TVA with regard to the program in which they are involved, the transplant program and the consultation required by the Act?

A. That's correct.

Q. In the year 1975 did you have occasion to [1–159] have a discussion with Mr. Thomas Ripley, of the TVA, with regard to whether or not the closure of the Tellico Dam and the creation of the reservoir would jeopardize the continued existence of the snail darter and destroy or modify the habitat of the snail darter?

A. Yes, I did.

Q. And when was that discussion?

A. That was a discussion that was held prior to my flying up and down the Little T River in March 1975.

Q. March of 1975, a year ago?

A. That is correct.

Q. And who is Mr. Thomas Ripley with TVA?

A. I think he is the Director of Forestry, Fisheries and Wildlife Department.

Q. And is he the individual with TVA who is in the upper echelon as far as the involvement of TVA with the snail darter program?

A. That is correct.

Q. And what was the statement that Dr. Ripley made to you with regard to the effect of the dam and reservoir upon the snail darter as I have previously related?

A. He indicated there was little question in his mind, or in anybody's mind, that the impoundment would in fact eliminate the darter in the Tellico Dam, or behind the Tellico Dam.

[1–160] The COURT. Mr. Pedersen, is there any issue on that question? You contend that this impoundment will not destroy the darter if it goes into the reservoir and will not change the habitat with the dam and when the water is emptied into the reservoir?

Mr. PEDERSEN. Well, our position about that is this, Your Honor. When we started with our conservation program and our research we did not know the extent of the range of the darter, and much of our research and exploration has been devoted to the question of is this the exclusive habitat of the darter or is the darter found elsewhere and does it live in reservoirs.

The COURT. The point is, do you contest the question that about whether or not the reservoir will change or modify the habitat and destroy the darter itself; do you contest that?

Mr. PEDERSEN. Well, two parts of it. We think it will have an effect on it. Certainly it will alter or modify the presently known habitat. We think the presently known habitat though is only part of the darter's actual habitat that nobody has ever

investigated, and we are the only ones who have ever gone to this question. Does the darter live and have its habitat elsewhere and especially does it [1–161] live in other reservoirs.

Now that goes to the question of——

The COURT. If you concede that the reservoir will change or modify the habitat and will destroy the darter, then why take up the time of the Court on that issue? Why don't we go to the issues about which you are concerned, instead of taking up time.

Mr. PEDERSEN. I see. Well, let me say that our knowledge is expanding rapidly on this.

It was just a few days ago that we found the darter surviving in the Chickamauga Reservoir eighty-five miles below.

The COURT. I understand, but I am talking about do you contest his contention that the darter will be destroyed in the reservoir and that the habitat will be changed materially or modified by the reservoir; now do you contest that?

Mr. PEDERSEN. We contest the first part but not the second part. In other words, we don't think that all the darters will be eliminated by the impoundment.

The COURT. All right. I understand you then. We will hear proof——

Mr. PEDERSEN. That is the reason the reservoir——

[1–162] The COURT. But you concede that the habitat will be modified materially

Mr. PEDERSEN. Yes, as now known.

The COURT. As now known.

Mr. PEDERSEN. As now known, yes.

The COURT. Well, are we going into the unknown today?

Mr. PEDERSEN. No. All I am saying is this, Your Honor. This program that we have started is going to continue. It is possible before this case is all over, possible in the Court of Appeals, that we may come in with evidence that will overturn this whole thing. We don't want to foreclose the question.

Mr. DOUGHERTY. If Your Honor please——

The COURT. The point is, I don't want to take up a lot of unnecessary time on issues which are not before the Court. If you have an issue, of course I will hear you. But where the issue is not contested I don't see the point in having me to listen to all this proof on a non-contested issue.

Mr. DOUGHERTY. Your Honor, may I respond briefly?

The COURT. Yes.

Mr. DOUGHERTY. To be frank with the Court under the Endangered Species Act, the only criteria [1–163] at that point is the question of critical habitat according to the designation by the Department of the Interior, and that being essentially, at a minimum, from river mile 4 to river mile 17. And the point is, I think TVA people will admit, and they have done so in their depositions, that——

The COURT. He's nodding his head. That is what I am trying to get him to do right now but I haven't been very successful.

Mr. PEDERSEN. No.

Mr. DOUGHERTY. That the area of the Little Tennessee River is at the very least, whether it is found elsewhere or not, is a significant portion of the range of the habitat for the snail darter. That being the case, may it please the Court, from the comments which Mr. Pedersen is making in terms of the issue, these are not really issues at all.

The COURT. I thought I was saving time by asking Mr. Pedersen the question but I am losing time. Go ahead.

Mr. PEDERSEN. We admit that part, Your Honor. We admit that the critical habitat that has been established between .05 up to .17 on the Little Tennessee River which is its now designated critical habitat will be altered or modified. We were agreeing [1–164] to that——

The COURT. We don't need any more proof on that point, since he admits it.

Mr. PEDERSEN. Yes, we were agreeing to that at the beginning of the case.

Mr. DOUGHERTY. If he will go further, the only point I am saying, Your Honor, and we will quit because I don't want to do this unless it is necessary, but if Mr. Pedersen will stipulate according to the language of the Act that the closure of the dam and the creation of the reservoir will jeopardize the continued existence of the darter, and that is what the statute says, or destroy or modify the critical habitat of the darter as it is designated in the Act and the application by the Department of the Interior, at the very least or in the area of river mile .5 to river mile 17. The point we are saying, Your Honor, we think we can prove that issue without a great deal of controversy and we could really get down to meat in the coconut of this lawsuit.

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But I felt like that we sort of had to put the proof on at this point.

The COURT. You've put it on, what I have been listening to for a third of the day.

Mr. PEDERSEN. Your Honor, it is material—let me say this, Your Honor. There is more than this [1–165] one issue. The other issue is whether TVA has acted arbitrary and capriciously in what it has been doing, and we certainly think that our research and our exploration to find it elsewhere goes to the question of whether we are in good faith trying to do all we can.

The COURT. Now, Mr. Pedersen, you are talking to the Court about something it already knows. I am not asking you about that.

I am just asking you whether you contest this issue about the destruction of the darter by the reservoir or the modification of the habitat of the darter by the reservoir.

Mr. PEDERSEN. No, we never did, never did.

The COURT. All right.

Mr. DOUGHERTY. In other words, we can stipulate that the closure of the dam and the creation of the reservoir will jeopardize the continued existence of the darter or destroy or modify the critical habitat of the darter?

Mr. PEDERSEN. Certainly will or modify the habitat. What it does to the darter itself, I don't know. They may move up and live as well as they did before.

The COURT. Well, but it will destroy, if it [1–166] tries to live in the reservoir, is that what you are conceding? That's what the proof shows so far.

Mr. PEDERSEN. The designated critical habitat, Your Honor, is only half of the river that the reservoir will cover.

In other words, the river goes, say, thirty-three—the reservoir will cover thirty-three miles of the river but only the lower seventeen of that is critical habitat as defined by Interior. You get what I mean?

The COURT. Yes.

Mr. PEDERSEN. Now, what the darter will do in the upper half, there's another sixteen miles up above, will it live there or not is one of the things that we are fighting about—will it go on up to the other half of the reservoir and survive there. If that helps you any to understand——

Mr. DOUGHERTY. Do you wear suspenders or a belt, as the old fellow says. The only reason I am concerned about the two elements of that statutory provision, we feel like we can show the violation and all we are concerned about is, and that is why I asked Mr. Pedersen if he would stipulate, that was why, maybe we could get to the other issues, but if Mr. Pedersen would stipulate that the closure of the [1–167] dam and the creation of the reservoir would jeopardize the continued existence of the snail darter or destroy or modify the critical habitat of the darter, I think we can go on to something else.

The COURT. Can you stipulate that, Mr. Pedersen.

Mr. PEDERSEN. If he will do, "or." We have got that "or" in there.

The COURT. All right. Don't take out the "or", it might hurt somebody.

Mr. DOUGHERTY. Well, the only point that concerns me, he says yes and then he qualifies it.

The COURT. I think he said yes unqualified.

Mr. DOUGHERTY. If he would go along with my stipulation without the qualification, I think we can go on.

The COURT. Well, do you?

Mr. PEDERSEN. Well, because when he says will it jeopardize the darter or modify or alter the critical habitat, I agree with that.

Mr. DOUGHERTY. In other words, you agree that both of them will occur?

Mr. PEDERSEN. No. Or, that is what I say, that's what the statute says. You don't have to have both.

[1–168] Mr. DOUGHERTY. The only reason I used the language I did is that is the statutory language.

The COURT. I don't seem to have any success on these stipulations. I am more confused than I was. Go ahead.

By Mr. DOUGHERTY:

Q. And would you just briefly, in order to collect our thoughts about that point, briefly relate to the Court the conversation that you had with Mr. Ripley and what Mr. Ripley told you about the effect of the dam closure and reservoir?

A. As we were discussing this the subject came up of the impact that the dam would have on the fish and the impoundment, and it was generally agreed in the discussions that

we had that, and he brought it up, that there was very little question by most people that this would in fact result in the elimination of the darter behind the dam in the impoundment area.

Q. Did he express that as his opinion on it?

A. Yes, he did.

Q. Is he a biologist with the TVA again?

A. Yes, he is.

Q. In fact, he is head of the entire division that is dealing with this as far as TVA is concerned?

A. That's correct.

[1–169] Q. Now, Dr. Williams, do you have an opinion and if so what is that opinion as to whether or not a transplant, successful or not, will comply with the requirement of the Endangered Species Act in connection with the snail darter situation?

Mr. PEDERSEN. We object to that, Your Honor. I think that is a legal question.

The COURT. Read the question.

[The question was read by the reporter.]

The COURT. Oh, these experts know a lot but they have no right to pass on the law. That's a question of law.

He can give his opinion on what will be the result of the transplant but not whether it complies or doesn't comply with the Act.

By Mr. DOUGHERTY:

Q. Let me ask you this, Dr. Williams: In connection with the proposed transplant program that the TVA is conducting, do you have an opinion as to whether or not that transplant program will have an effect with regard to whether or not the darter, the snail darter specifically, will be rendered or its continued existence jeopardized or the habitat designated as critical destroyed or modified?

The COURT. That question is competent except as to the length. You may answer it.

[1–170] Mr. DOUGHERTY. I am sorry, Your Honor, it is very long.

The COURT. All right, Doctor.

A. I think the transplant program will not have any bearing on the survival of the population in the Little T one way or other.

By Mr. DOUGHERTY:

Q. Have you examined the transplant program being undertaken by the TVA?

A. Yes, I have.

Q. In the Hiwassee River?

A. That is correct.

Q. And have you read and examined all the data collected and reports prepared by TVA in connection with the transplant program?

A. Yes, I have.

Q. Do you have an opinion as an ichthyologist as to whether or not that transplant program in the Hiwassee River with regard to the snail darter will be successful?

A. At this point it is inconclusive.

Q. Is there any definitive evidence at this point in time that the transplant is successful?

A. No, there is not.

Q. Is there any definitive evidence at this point in time, and this would include your consideration of [1–171] any documents or information from TVA ,that there has been any successful and effective reproductive activity in the snail darters in the Hiwassee River?

A. No.

Q. Will the transplant in the Hiwassee River in any way prevent the jeopardizing of the continued existence of the snail darter or the destruction or modification of the critical habitat of the snail darter?

A. No.

Q. Would your opinion as an ichthyologist and its relationship to the Endangered Species Act in any way be altered with regard to the snail darter and Little Tennessee River if specimens of the snail darter were found elsewhere, let's assume just for the purpose of discussion, in the Watts Bar Reservoir?

A. No.

Q. Or in the Chickamauga Reservoir below Watts Bar Dam?

A. No.

Q. Have there been occasions where you specifically have advised representatives of TVA, and specifically Mr. Ripley and others, in connection with their responsibilities under the Endangered Species Act?

A. The Fish and Wildlife Service has on occasion, yes.

[1–172] Q. And have you been present at any of the consultation meetings that have taken place between TVA and others?

A. Yes, I have.

Q. And I believe one of those occurred in Nashville, Tennessee within this year, 1976?

A. That is correct. The 14th of February. I believe it was.

Q. What evidence do you have, Dr. Williams, that the defendant TVA has taken any action to insure that the proposed project, the closure of the Tellico Dam and the creation of the Tellico Reservoir, will not jeopardize the continued existence of the snail darter or destroy or modify the critical habitat of the snail darter?

A. They have, well, we have discussed in our consultations, there has been activity relating to the transplant operation. That has been the extent of it.

Q. Have they in any way attempted to discuss possible alternatives to the closure of the dam itself?

A. No, they have not.

Q. With regard to the comment that TVA has presented to your office, the Office of Endangered Species, first of all with regard to the listing and secondly with regard to the designated critical habitat, were their comments filed on time?

A. They made it in, I think on both occasions, [1–173] one or two days before the end of the comment period. But they were in under the wire, just barely.

Q. And in your dealings with the TVA have they cooperated with you and your office?

A. Yes, they have made available reports and this sort of thing.

Q. But the only thing TVA has been willing to discuss and deal with is the question of transplant and not any alternatives?

The COURT. You have gone over that, Mr. Dougherty.

Q. [Continuing.] The program itself.

A. That's right.

The COURT. You have gone over that. Please don't repeat.

Mr. DOUGHERTY. Just one moment. I think I am almost through.

That is all I have at this time, Your Honor.

Mr. PEDERSEN. If Your Honor please, in accordance with our agreement with counsel I would like to file his entire deposition

which required half a day and was taken on April 5th, with all the attachments.

The reason I say that, there are a great number of documents, at least thirty-eight documents.

[1–174] The COURT. If counsel has no objection then the Court doesn't. Go ahead.

Mr. DOUGHERTY. I have no objection.

Mr. PEDERSEN. With that in mind then I could ask very few questions.

The COURT. Anything that will cut your questions down, I will agree to it.

Mr. PEDERSEN. You are speaking of both of us.

[Laughter in the courtroom.]

CROSS-EXAMINATION

By Mr. PEDERSEN:

Q. Dr. Williams, have you been advised about the TVA finding of the darter in the Chickamauga Reservoir?

A. We received, I received I believe a mailgram stating that divers had sighted what appeared to be snail darters.

Q. Yes. They sent you that special, I guess, did they not?

A. It was air mail or airgram, yes.

Q. And they furnished you, of course, a full report of the whole program every two weeks, did they not, bi-weekly report?

A. That is correct.

Q. And have given everything, actually, that you [1–175] have ever asked for or that they have, isn't that correct?

A. Everything that we have ever asked for, yes.

Q. And I believe you stated you found no fault with the transplant program, the conservation program.

A. No.

Q. Now with respect to this find in the Chickamauga, eighty-five miles downstream from the mouth of the Little Tennessee River, do you consider that a significant or a highly significant discovery?

A. I think until we have actual specimens to have in hand that I kind of doubt that, actually. Something, a brief sighting by a diver in fifteen feet of water, someone who is not trained in the science of ichthyology, I would certainly like to see speci-

mens before we really make any determination as to what that means.

Q. Have you ever talked to any of these divers?

A. No, I haven't.

Q. You don't know whether they are trained or ichthyologists?

A. I know most of the trained ichthyologists in the southeast and I don't think any of them are divers for TVA.

Q. Would you say that they are experienced biologists, fishery biologists?

A. I couldn't testify to that.

[1–176] Q. You probably would know supposedly at least, that they have seen more darters than any other group of people ever assembled on the continent, would you not, or on this planet?

A. Perhaps more snail darters but not darters.

Q. I mean more snail darters, yes.

A. As many as most people, yes.

Q. In fact, they are the main source outside of Coytee Springs in finding them elsewhere, isn't it?

A. Yes, sir.

Q. There has been testimony here from prior experts that that find was highly significant and was also strong evidence that the darter is reproducing there. Do you agree with that?

Mr. DOUGHERTY. Your Honor, I object——

The COURT. Wait a minute. Read the question.

[The question was read by the reporter.]

The COURT. No, no, that's not the way to examine a witness; no, no, no.

Just ask him without referring to testimony, any of the other testimony.

By Mr. PEDERSEN:

Q. Would—first of all, would you think that such a discovery was highly significant?

A. If I saw the specimen in hand that in fact [1–177] did come from there, I would consider that significant.

Q. Would you consider it highly significant? You are nodding yes but——

A. Yes.

Q. Would you consider that as good evidence that the animal reproduces there?

A. Based on one individual?

Q. Two.

A. Two. Possibly.

Q. You know they are not going through the turbines of a dam, don't you?

A. I think we can assume that, yes.

Q. You know they are not drifting downriver from somewhere else, right?

A. I understand the Hiwassee goes into the Chickamauga. That's a possibility.

Q. I see. Now, as I understood your testimony, you are the only ichthyologist in the Washington office, right?

A. That is correct.

Q. And you have no ichthyologist in your Atlanta office?

A. That is correct.

Q. That's the one you have asked us to confer with.

[1–178] A. Consult with.

Q. Yes, consult with. There are no ichthyologists there though.

A. That is correct.

Q. And there is no ichthyologist in your Nashville office?

A. That is correct.

Q. There are no ichthyologists in your Norris office?

A. That's correct.

Q. Although there are two men out at Norris who have been there for many years and worked with TVA people, is that not true?

A. Yes. They are fishery biologists in all of those offices.

Q. Now this discussion that you had with Dr. Ripley, you say was in March of 1975?

A. I believe that is correct.

Q. Is that the time when they invited you to come down on the tour?

A. That is correct.

Q. And they took you in the helicopter and toured the project; was it on that occasion?

A. Yes, it was.

Q. Was that before or after they found the [1-179] darter in the Watts Bar Reservoir?

A. It would be prior to the finding.

Q. They hadn't found it in Watts Bar?
A. That is correct.
Q. Nor had they found any in the Chickamauga Reservoir?
A. That is correct.
Mr. PEDERSEN. We want the deposition and all the exhibits marked and filed as part of the record.
The COURT. All right.
[Exhibit No. 49 was filed.]
Mr. DOUGHERTY. May I inquire, the exhibits that you have attached to Dr. Williams' deposition are only those exhibits that we admitted at the time of the deposition or which he was to furnish?
Mr. PEDERSEN. Probably the bottom documents.
Mr. DOUGHERTY. I don't believe the bottom documents were exhibits.
Mr. PEDERSEN. Yes. They went in with a letter of January 22 that had the whole log——
Mr. DOUGHERTY. Your Honor, I must object because I have never seen those exhibits as a part of Dr. Williams' deposition.
The COURT. They may go in as a part of the technical record but they are not received as [1–180] evidence, if you haven't seen them, but they can go in as part of the record.
Mr. PEDERSEN. The letter of January 22nd to which all these exhibits are attached, is a part of his deposition that we took. That letter was put in evidence and it has all those exhibits with it too.
Mr. DOUGHERTY. Your Honor, I must honestly say, the letter is an exhibit but the other items that he has, the thick documents on the bottom, were not exhibits to the deposition and I made objection to them——
Mr. PEDERSEN. They were an attachment and part of the letter and therefore they are part of the letter. The letter says it has these attachments.
The COURT. Let them go into the record and I will give them such consideration as they are entitled to.
Mr. DOUGHERTY. And the exhibits that I am objecting to are the thick documents at the bottom which are attached which I have not seen as a part of Dr. Williams' deposition.
[1–181]

REDIRECT EXAMINATION

By Mr. DOUGHERTY:
Q. To clarify the record a little bit, Dr. Williams, just because someone is a biologist, that does not make that person an ichthyologist?
A. That is correct.
Q. An ichthyologist is someone who has considerable more expertise in the area of fishes and things of that concern?
A. That is correct.
Q. Now in March of 1975 when you came down here and went in TVA's helicopter and looked over the Little Tennessee River, was there some discussion with representatives of the TVA, and particularly Mr. Ripley, with regard to the clear-cutting along the banks of the Little Tennessee River, the cutting of trees, foliage and clearing?
A. Yes, there were.
Q. And following that visit down here what representations did Mr. Ripley make to you with regard to such clear-cutting and will you advise the Court whether or not such representations were carried through or not?
A. They indicated the clearing would be restricted and would not be that extensive and they were going to try to keep it away from the banks of the river and save that for last to prevent siltation.
[1–182] Q. And have you specifically observed that something contrary has taken place?
A. The area around Coytee Springs that I observed was clear-cut all the way to the water.
Q. And was that what Mr. Ripley told you would not take place?
A. He indicated that the trees along the bank would be left until the very end of the clearing operation.
Q. And is not Coytee Springs one of the major areas where the snail darter has been located and found?
A. Yes. It has been found to be abundant there.
Mr. DOUGHERTY. That is all I have of the witness.
The COURT. You don't want to ask anything else, do you, Mr. Pedersen?
Mr. PEDERSEN. One moment, please.
Mr. DOUGHERTY. While Mr. Pedersen is thinking, may I ask one question, Your Honor.

By Mr. DOUGHERTY:

Q. In connection with your dealings with the TVA, although there are other representatives of the U.S. Fish and Wildlife Service that engage in some contact with the Atlanta office, Nashville and Norris, you are the primary liaison in terms of expertise that communicates with TVA; is that not correct? [1–183] A. That is correct.

Q. And in connection with a comment concerning the cooperation that TVA has engaged in with you and your office, to what extent has TVA fully cooperated with you and your office with regard to all of the activities that you have been involved in with TVA?

A. You mean in relation to this particular project?

Q. Yes.

A. They have been very helpful in sending us information on the transplant activities but it has been restricted to that.

We haven't received anything beyond that with the exception of some information on clearing, timber sales, and siltation, past and present measurements. That has been the extent of it.

Q. But in connection with the other matters involved on the project and the relationship of the snail darter, they have provided you no information?

A. There has been no other information.

Mr. DOUGHERTY. That is all.

RECROSS EXAMINATION

By Mr. PEDERSEN:

Q. Dr. Williams, do you have that letter of [1–184] January 22nd available to you?

A. I don't have it with me.

Mr. DOUGHERTY. Did you say January or April?

Mr. PEDERSEN. January 22nd filed as an exhibit to your testimony, at pages 59 and 60 of his deposition.

By Mr. PEDERSEN:

Q. I will ask you if it is not a fact that with that letter was included the entire final environmental impact statement that was attached as Exhibit A, the Timberlake New Community Development Draft Environmental Impact Statement attached as Exhibit B, the Tellico Reservoir Construction Specifications

for Reservoir Drainage, attachment C; also included a summary statement entitled The Tellico Project and The Proposed Timberlake New Community as attachment D; various maps, attachment E through G, which may be helpful in understanding the project and circumstances surrounding the conservation effort program to November 10, 1975, and the listing of the snail darter, and if that didn't give the entire project background, the description of the entire project, complete details, the Congressional approval and funding of the project, the project status and schedule, the Tellico construction status and fund obligations through November 30, 1975, the Tellico project fiscal 1972 and transition budget period, land [1–185] acquisition adjustments, dam construction and inter-reservoir canal, reservoir clearing, road construction, related community developments, the snail darter conservation program.

Wasn't that all in that letter?

The COURT. Did you want to say something?

Mr. DOUGHERTY. I would like to clarify my objection. In connection with Dr. Williams'——

The COURT. I don't need clarification. Do you object to it?

Mr. DOUGHERTY. I object to it in the sense that he refers to it and also refers to the documents which he referred to—I have in my hand all of the exhibits which I got from Mr. Della Volpe himself which were exhibits to Dr. Williams' deposition.

The COURT. I overrule the objection. You may answer.

Mr. DOUGHERTY. May I make one further statement?

The COURT. No, no, that's all I want to hear.

Mr. DOUGHERTY. The only point is to clarify the record.

The COURT. The record is already clarified. I don't want any more talk about the record.

Mr. DOUGHERTY. The only thing I am saying [1–186] is——

The COURT. Now I have overruled your objection and I don't want you talking any more on that objection, Mr. Dougherty. I have ruled.

Mr. DOUGHERTY. This is a different aspect and then I will hush.

The COURT. Well, I don't want to take up the time with your objection. I want to hear these witnesses. You have taken up too much time already.

Mr. DOUGHERTY. I understand that, Your Honor. I want to make the record clear and Your Honor clear——

The COURT. I don't want you to talk in the record. I have heard all I want you to talk.

Mr. DOUGHERTY. I apologize, Your Honor. I am not in any way trying to cause a problem but I think it important and I need to communicate to the Court.

The COURT. Well, make your objection and I have ruled on it. If you have another objection make it then but hurry up and do it.

Mr. DOUGHERTY. The objection is in connection with this: That in connection with the attempted introduction of Dr. Williams' disposition, I objected to any filing of the environmental impact statement [1–187] whether it's an exhibit or not. I don't think it has any bearing on the issues in this lawsuit.

The COURT. The Court rules that it may go in as part of the background of this litigation, and the objection is overruled.

Mr. DOUGHERTY. If I may note an exception.

The COURT. You don't have to note an exception.

Mr. DOUGHERTY. I understand.

The COURT. It is overruled.

By Mr. PEDERSEN:

Q. All those matters are in that letter, are they not, Dr. Williams?

A. We did receive a copy of this. It was addressed to our regional director in Atlanta.

Q. Look at the back page. You got a copy with all attachments, did you not; right?

A. They didn't filter down to me personally. They may have been sent but they didn't——

Q. They were sent originally to the Atlanta office because the Atlanta office was designated as the one to which we should send it, right?

A. That is correct.

Q. And we sent it there.

A. That's correct.

[1–188] Q. In addition we sent a copy to the Washington office, to the attention of whom?

A. Mr. Keith Schriner [phonetic], I think.

Q. And who is he?

A. He's the associate director of U.S. Fish and Wildlife Services.

Q. He is the associate director?

A. Yes, sir.

Q. He is your supervisor, is he not?

A. Up the line, yes.

Q. Up the line, yes.

A. Yes.

The COURT. Is that all?

Mr. PEDERSEN. That is all.

The COURT. That is all, Doctor.

The WITNESS. I apologize for appearing without a coat.

The COURT. All right.

[Witness excused.]

Mr. DOUGHERTY. Your Honor, that is all the witnesses we have. I have some short testimony from the deposition of Dr. Boschung and if I may read just portions of it that will conclude our proof.

The COURT. All right.

Mr. DOUGHERTY. Dr. Boschung was originally [1–189] scheduled as a witness but was unable to come in connection with his commitment at the University of Alabama.

I would like to introduce at this time the deposition of Dr. Herbert T. Boschung, Jr., taken on the 31st day of March, 1976, pursuant to agreement between the parties; examination by Mr. Pedersen. .

Dr. HERBERT T. BOSCHUNG, Jr., testified by deposition as follows:

DIRECT EXAMINATION

By Mr. DOUGHERTY:

"Q. State your full name and your residence for the record, please, sir.

"A. Herbert Boschung, Herbert Theodore Boschung, Jr.; my residence is 6 Country Club Lane, Tuscaloosa, Alabama.

"Q. What is your occupation, sir?

"A. I am professor of biology and Director of the Alabama Museum of Natural History.

"Q. What is your academic background?

"A. Biology, zoology.

"Q. What degrees do you have in these areas?

"A. B.S., M.S., Ph. D.

"Q. All at Alabama?

[1–190] "A. At Alabama.

"Q. And how long have you been on the faculty there?

"A. I'm in my twenty-sixth year, well, since January of 1950; so I guess I'm going into my twenty-seventh year.

"Q. You have taught all of your professional career, in other words.

"A. Yes."

Mr. DOUGHERTY. Question on line 6, page 4.

By Mr. DOUGHERTY.

"Q. Just for yourself. Do you do considerable consulting work?

"A. I do consulting work. I don't know, what do you mean by considerable?

"Q. Well, I didn't know how much of your time was spent in consulting and testifying and so forth.

"A. I spend time consulting and doing research projects on contract for various agencies. My consulting is limited by my employer to one day a week."

Mr. DOUGHERTY. Then he was asked the question whether he had ever testified in a case before and he said he never had.

Line 11, page 5.

By Mr. DOUGHERTY.

[1–191] "Q. You are a professional ichthyologist, is that correct?

"A. Yes, I guess you could say that.

"Q. Any particular branch of that, taxonomy or otherwise, or ecology?

"A. Systematics and ecology, a great deal of my work in past years has been in terms of ichthyological surveys."

Mr. DOUGHERTY. Then he goes into comments concerning the societies he is a member of.

On page 6:

By Mr. DOUGHERTY.

"Q. As a member of the American Ichthyological Society, have you had a chance to become acquainted with Dr. Raney?"

Mr. DOUGHERTY. He is the witness that the defense, TVA, will offer.

By Mr. DOUGHERTY.

"Q. [continuing]. "Do you know him?

"A. I do know Dr. Raney.

"Q. Have you known him for some time?

"A. I've been knowing of him for quite a long time, and I expect I met him for the first time about 1960 or '61.

"Q. He was president of that society for a couple [1–192] of terms, was he not?

"A. I could not tell you whether he was. I feel certain he was at least once. I don't know whether he was president twice or not. I think it would be safe to assume that he has been president of it in the past. I wouldn't swear to that. I think he has been. I'd be surprised if he hasn't been.

"Q. He's a national figure in the field of ichthyology, is he not?

"A. Yes, he has a national reputation."

Mr. DOUGHERTY. Then going down to line 25.

By Mr. DOUGHERTY:

"Q. Yes. Did you study under him at all?

"A. No, I did not.

"Q. You don't question his competency"——

The COURT. What is the purpose of this testimony, Mr. Dougherty?

Mr. DOUGHERTY. Pardon me?

The COURT. What is the purpose of this testimony?

Mr. DOUGHERTY. Well, in connection with some of the opinions expressed by Dr. Raney, the main point is that this individual, Dr. Boschung, is also an ichthyologist and challenges some of the opinions expressed by Dr. Raney as far as——

[1–193] The COURT. Well, why don't you just turn to the opinion and read them to me instead of going through all of that.

Mr. DOUGHERTY. That is what I am coming to, Your Honor.

The COURT. But it is taking a long time to get to it. Go right to it and I will listen to you.

By Mr. DOUGHERTY:

"Q. You don't question his competency in the field of ichthyology, I take it.

"A. Well, I think perhaps I do question his competence.

"Q. In what respect?

"A. Well, in the fact that I did not particularly agree with the statements I read that he was purported to have made. I couldn't agree with them.

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"Q. Could you be more specific about that, in what statements and in what regard, in what respects you disagree with him?

"A. Well, I'm thinking specifically of the statement that he made in reference to the fact that Percina tanasi was not a good species. I think he is on record as making that statement in the past. I couldn't agree with him on that."

• • • • • • •

[1–194] "A. I did not review his statement before I left. In fact, I really did nothing to prepare for this questioning. But it seems to me I remember disagreeing with some of the statements that I read, some of Dr. Raney's statements, in reference to the snail darter, one of which, I believe I'm correct in saying, h was of the opinion, or at least he inferred that this was not , we would call a good species. And I believe that I recall him saying that the snail darter was probably more widespread than we know its range to be. I disagree with that, based on the vast numbers of collections in the area of the Little Tennessee and the surrounding watersheds. When I read that, I think that if the snail darter existed in any abundance at all with any regularity and with any success, that in these days and times, it would have been discovered elsewhere because there are a tremendous number of collections that have been made. I'm in the process now of plotting the collections made in the south bend of the Tennessee River, and you take them out, and it looks like someone hit it with birdshot, there are so many dots on it."

Mr. DOUGHERTY. Going to line 10, page 9.

By Mr. DOUGHERTY:

"Q. What do you say is its habitat?"—referring to the snail darter.

"A. Well, what knowledge I have of it, its [1–195] habitat is a limited section of the lower Little Tennessee River. The only place I have firsthand knowledge of it is at the Coytee Spring area. I have collected it there. I have not attempted to collect it elsewhere in the Little Tennessee River.

"Q. When did you collect it there?

"A. Less than a year ago. It was spring of last year.

"Q. How many specimens did you collect?

"A. I think we took about six or maybe seven.

"Q. Who is 'we'?

"A. I visited this site with Dr. Etnier and some of his students and one of my students."

Mr. DOUGHERTY. The question on page 16, line 1.

By Mr. DOUGHERTY:

"Q. It had some hope, yes. Now, would it surprise you to find that it would be found elsewhere, or do you say as a categorical fact that it will not be found?

"A. I'm not saying categorically that it would not be found elsewhere, but I would say that it would surprise me if it would be found elsewhere in a successful population, one that sustains itself. I would be very surprised if you found it elsewhere simply, well, for one reason, I think over the eons of time, that this fish has, [1–196] like many others, has an occasional opportunity to extend its range."

Mr. DOUGHERTY. Going to page 42, line 5.

By Mr. DOUGHERTY:

Q. Dr. Boschung, do you have an opinion as to whether or not the snail darter, otherwise known as Percina Imostoma tanasi, can live and survive and successfully reproduce in an impounded reservoir area, with depths in excess of ten feet?

"A. Let me answer the question this way. It is my opinion that the darter could not sustain itself in a reservoir condition, regardless of the depth, because it's my opinion that the darter requires a riffle condition, free-flowing water, a gravel substrata. It's my opinion that if the reservoir was five or ten feet deep or a hundred and ten feet deep, it wouldn't make that much difference, provided the water was slack. If the water is slack, I don't believe the animal will exist. So I do not believe that the animal can sustain itself, the species of population can sustain itself in a reservoir environment."

Mr. DOUGHERTY. If I may, Your Honor, file as an exhibit the vitae of Dr. Boschung as Exhibit No. 50.

[Exhibit No. 50 was filed.]

Mr. DOUGHERTY. If I may file Dr. Boschung's [1–197] deposition in evidence.

The COURT. Received.

Mr. DOUGHERTY. Can I confer just one moment. I think we will be completed.

Your Honor, as far as the factual presentation, the plaintiffs rest.

Mr. PEDERSEN. We have these additional matters in Dr. Boschung's deposition which I would like to point out. In the first place, he concedes he had only been at the Coytee Springs site one time in his life and that was the time he went up there with that party with Dr. Etnier, the only time in his life he had ever been there.

He was asked how many species of darters there are, and he said he couldn't tell. And he was asked, well, is that your specialty, darters, or what is your specialty; no, sir, darters is not my specialty.

And I asked him, well, what was your specialty, and the answer was:

"Well, fish that I have studied more intensely than any others is the genus Britheostoma,"—whatever it is—which is a very, very primitive fish-like four-legged animal."

And then he was asked "Is it your view that no darters survive in reservoirs?" And he says, [1–198] "No, sir, not at all. Some darters do survive in reservoirs."

The COURT. All right. Are you ready to put on your proof?

Mr. WAGNER. Yes, Your Honor, we are.

The COURT. Do you have a short witness that will last until about 3 o'clock? We will take a recess then.

Mr. WAGNER. Yes, Your Honor, I will.

Mr. PEDERSEN. Are you taking a short recess now?

The COURT. Well, I intended to at 3 o'clock. If you want one now I will take it.

Mr. WAGNER. Your Honor, we can put on George Kimmons. Our direct examination of Mr. Kimmons will be extremely brief.

Mr. DOUGHERTY. But his cross-examination may take some time.

The COURT. Well, remember, the Court will have something to do with that. I will tell you whether it will take some time. You overlooked that.

Mr. DOUGHERTY. I understand that perfectly, Your Honor.

Mr. WAGNER. Your Honor, at the outset we have a few exhibits ourselves that maybe would save [1-199] time if we put them in now.

The COURT. All right.

Mr. WAGNER. Nine pictures showing the snail darter in the habitat at twenty-seven feet of water below the Tellico Dam. We would like to have those marked consecutively.

Mr. DOUGHERTY. In order to clarify it, I think the record should reflect it was at river mile .2 or .3, in the Little Tennessee River.

The COURT. All right.

Mr. WAGNER. Below the Tellico Dam.

The COURT. All right.

[Exhibits Nos. 51 through 59 were filed.]

Mr. WAGNER. A slide showing the substrate of the Little Tennessee River on September 15, 1975.

[Exhibit No. 60 was filed.]

Mr. WAGNER. And a slide showing the substrate on the bottom of the Hiwassee River in the area of the TVA transplant site on September 15, 1975.

The COURT. Do you want to see them?

Mr. DOUGHERTY. Inadvertently I don't think we have seen them.

The COURT. Show them to him.

Mr. DOUGHERTY. We have seen everything else.

Mr. WAGNER. Sure.

[42 Fed. Reg. 4868–72]

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

[50 CFR Part 17]

ENDANGERED AND THREATENED WILDLIFE AND PLANTS

Proposed Provisions for Interagency Corporation

Proposed regulations to assist the Federal agencies in complying with section 7 of the Endangered Species Act of 1973.

The Assistant Secretary for Fish and Wildlife and Parks, U.S. Department of the Interior, and the Direc-

tor, National Marine Fisheries Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce, hereby jointly issue substantively identical proposed rulemakings that would establish rules and procedures for interagency cooperation pursuant to section 7 of the Endangered Species Act of 1973, 16 U.S.C. 1531–1543 (hereinafter cited as Act). The U.S. Fish and Wildlife Service (hereinafter cited in this preamble as FWS) regulations would be established in Part 17 of Chapter I of Title 50, Code of Federal Regulations, while the National Marine Fisheries Service (hereinafter cited in this preamble as NMFS) regulations (published elsewhere in this issue, see FR Doc 77–2382, published in the proposed rules section of this issue under the Department of Commerce) would be established in Parts 217 and 223 of Chapter II of Title 50, Code of Federal Regulations. The NMFS regulations in Parts 217 and 223 are only for those species under the jurisdictional responsibilities of the Secretary of Commerce (endangered species are identified in 50 CFR 222.23(a) and threatened species are identified in 50 CFR 227.4). The FWS regulations in Part 17 would apply to all other endangered and threatened species.

BACKGROUND

The Act became effective on December 28, 1973. Recognizing that all Federal agencies must cooperate to conserve and protect endangered and threatened species and their habitat, section 7 of the Act states:

"INTERAGENCY COOPERATION

"Section 7. The Secretary shall review other programs administered by him and utilize such programs in furtherance of the purposes of this Act. All other Federal departments and agencies shall, in consultation with and with the assistance of the Secretary, utilize their authorities in furtherance of the purposes of this Act by carrying out programs for the conservation of endangered species and threatened species listed pursuant to section 4 of this Act and by taking such action necessary to in-

sure that actions authorized, funded, or carried out by them do not jeopardize the continued existence of such endangered species and threatened species or result in the destruction or modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with the affected States, to be critical."

By internal memorandrm of October 16, 1974, the Secretary of the Interior further defined Interior's responsibilities under section 7 and established the lead role of the FWS within the Department of the Interior.

In a joint letter to all Federal agencies on December 3, 1974, the Secretaries of the Interior and Commerce pointed out the responsibilities of the agencies under section 7 and aked for their cooperation in implementing the Act. The letter of December 3 also clarified the responsibiilties of the FWS and the NMFS as lead agencies for the two Departments in implementation of the Act.

On April 22, 1975, the Director of the FWS and the Director of the NMFS published a joint notice in the Federal Register (40 FR 17764–17765) describing how "critical habitat" would be determined for endangered and threatened species pursuant to section 7 of the Act.

On May 29, 1975, the FWS and NMFS convened a conference for affected Federal agencies to discuss the Act and its implications for the activities and programs of the agencies. At this meeting, the Federal agencies requested that guidelines be developed to assist them in meeting their responsibilities under section 7.

In response to that request, the FWS and NMFS convened an Ad Hoc Interagency Committee of representatives from 11 Federal agencies to advise the two Services in developing the necessary guidelines.

An April 22, 1976, "Guidelines to Assist the Federal Agencies in Complying with Section 7 of the Endangered Species Act of 1973" were transmitted to all Federal agencies by the FWS and NMFS. These guidelines are an interim measure to furnish a broad and flexible framework within which Federal agencies may prepare internal procedures to fulfill their responsibilities under section 7. However, as stated in the guidelines, they are "a starting

point for the development and promulgation of regulations."

At the request of the Office of Management and Budget, copies of the guidelines were again transmitted to the Federal agencies on May 20, 1976, and comments due by August 1, 1976, were solicited for a "quality of life" review. As of September 28, 1976, 40 comments had been received from Federal agencies. Although 8 comments expressed unequivocal support for the guidelines and 3 comments were opposed, the remaining 29 did not express general support or opposition, limiting themselves to comments on particular language, organization, or approach. Seven of the 29 simply stated they had no comment at that time.

The guidelines were subsequently revised by the FWS and NMFS for publication as a proposed rulemaking incorporating various comments of the Federal agencies. At the request of the Office of Management and Budget, the Director of the FWS, on behalf of the FWS and of the NMFS, forwarded this draft proposed rulemaking to the affected Federal agencies on November 11, 1976, requesting comments not later than December 1, 1976. As of January 5, 1977, 4 Federal agencies had commented. The draft regulations were than revised for this proposed rulemaking, incorporating many of the Federal agency comments.

DISCUSSION OF THE COMMENTS OF THE FEDERAL AGENCIES

Many of the comments of the Federal agencies on both the guidelines and draft regulations were clearly appropriate, have been incorporated into the proposed regulations, and need not be discussed here. However, several comments, whether adopted or not, merit discussion because of their importance and generality.

First, nearly one-third of the Federal agencies commenting indicated that use of the consultation process should be discretionary with the agency, although the Council on Environmental Quality took the opposite position. The position taken in the proposed rulemaking affirms the ultimate responsibility of each individual

agency to decide whether or not it is in compliance with the Act. The proposal establishes a fixed procedure of consultation because the FWS and NMFS believe they cannot responsibly fulfill their obligations under section 7 unless there is a rational and uniform procedure for the provision of biological advice to agencies considering actions within the borders of section 7.

Second, nearly one-third of the Federal agencies commenting expressed in one form or another that set time frames are necessary for the consultation process. The FWS and NMFS acknowledge these agencies concern that the process not be protracted. They have adopted a 60-day limit for threshold examinations and a 60-day limit for all consultation following receipt of information adequate for a biological opinion, except where special difficulty is incurred in obtaining necessary data. The FWS and NMFS do not expect that consultation will normally be protracted and anticipate that many requests for consultation will be dispatched summarily after a threshold examination. Nonetheless, the FWS and NMFS would be abdicating their responsibilities under section 7 if they were to commit themselves without exception to a time frame that in some cases would render inadequate biological advice. Therefore, the proposal leaves to agreement of the affected agency and the FWS or NMFS the time frame for completion of consultation on especially difficult actions.

Third, about one-fourth of the Federal agencies commenting stressed the need for habitat maps or published geographic coordinates for listed species, and the FWS and NMFS concur. The FWS is now working to satisfy the need, and has already designated critical habitat. This deficiency is not a valid reason for withholding implementation of the proposal, however, because the requirements of section 7 apply to Federal agencies even in the absence of a rulemaking such as that proposed, and it is to the Federal agency's advantage to have whatever biological advice and assistance the FWS and NMFS have to offer. The intended proposal simply establishes uniform procedures whereby Federal agencies can obtain the best available biological opinion as to

the effect of an action on endangered or threatened species.

Fourth, about one-quarter of the Federal agencies commenting, including the Council on Environmental Quality, suggested that the consultation process should be linked to established procedures for interagency review of environmental impact statements. The FWS and NMFS expressly support this suggestion in the proposal and encourage it as a means to reduce paperwork.

Fifth, 4 of the Federal agencies expressed the opinion that the preparation and usual intragency review of environmental impact statements satisfy the consultation requirements of section 7. The Council on Environmental Quality did not support this position, but stated that an environmental impact statement should be prepared if an activity or program would jeopardize a species or potentially destroy its critical habitat. Although the FWS and the NMFS encourage consolidation of section 7 consultation and impact statement review, they will only be able to fulfill their obligations under section 7 if agencies that so consolidate will comply with the procedures stated in this proposal and will state the biological opinions of the FWS and NMFS pursuant to section 7 in final environmental impact statements, assessments, or other documents.

Sixth, 4 of the Federal agencies commenting indicated that advanced projects should be exempted from the requirements of section 7. Neither FWS nor NMFS intends that section 7 bring about the waste that can occur if an advanced project is halted. The proposed regulations would clearly limit application of section 7 to cases where Federal involvement or control remains and in itself could jeopardize the continued existence of a listed species or modify or destroy its critical habitat. That the proposal would not exempt advanced projects where such Federal involvement or control remains simply reflects the belief of the FWS and the NMFS that their role under section 7 is limited to providing biological advice and assistance, not in determining if a project may continue. The affected agency must decide whether the degree of completion and extent of public funding

of particular projects justify an action that may be otherwise inconsistent with section 7. It seems reasonable that such an agency should seek the advice of the FWS or of the NMFS as to the effect the action will have upon the species in question, so that the agency may weigh the biological effect among other factors in reaching a decision.

Seventh, 3 of the Federal agencies commenting stressed that critical habitat should be the minimum habitat required by the Act or that the meaning of "modification" of such habitat in section 7 should be strictly qualified. The intended proposal incorporates both of these suggestions. Critical habitat is defined as habitat "the loss of which would appreciably decrease the likelihood of survival and recovery of a listed species or a distinct segment of its population." Modification is incorporated in the phrase "destruction or adverse modification," and then defined to be an alteration that appreciably diminishes the value of that habitat for a listed species.

Eighth, 3 of the Federal agencies commenting expressed the opinion that section 7 has no extraterritorial application, and a fourth agency stated that critical habitat should not be determined extraterritorially. However, the Council on Environmental Quality strongly supported extraterritorial application of section 7, and questioned whether it was appropriate to preclude determination of critical habitat in foreign countries. The proposal adopts the position that critical habitat may not be determined in foreign countries. However, the requirement that Federal agency actions not jeopardize the continued existence of listed species is taken to be applicable to listed species wherever occurring. This position adopts the recommendations of the Interior Department Solicitor's Office and the General Counsel's Office of the National Oceanic and Atmospheric Administration on the issue.

Ninth, 4 of the Federal agencies commenting stated that non-Federal entities should be able to consult with the FWS or the NMFS on behalf of the Federal agency. In response, the regulations for proposal have been revised to clarify that the affected Federal agency may ob-

tain technical assistance from any source. However, the proposed regulations emphasize that the Federal agency must take full responsibiilty for the initiation, carrying out, and completion of consultation, and may not delegate it.

Tenth, several Federal agencies, both formally and informally, have inquired as to the assistance the FWS and the NMFS will provide in consultation. The proposed regulations have been revised to spell this out as clearly as possible. In general, the FWS and the NMFS take responsibility for review of information provided to them by the affected agency, and they will advise agencies on the kind of information needed and may perform on-site inspections. However, the FWS and the NMFS cannot commit themselves to fund or to carry out the basic study necessary for decision.

All comments of the Federal agencies have been considered in developing the proposed regulations and are maintained in the Office of the Associate Director for Federal Assistance, U.S. Fish and Wildlife Service, Department of the Interior, Washington, D.C. 20240.

DESCRIPTION OF THE PROPOSAL

The purpose of this proposal is to establish joint rules and procedures for interagency cooperation pursuant to section 7 of the Act. Although these proposed regulations are codified for the FWS in Chapter I of Title 50 of the Code of Federal Regulations, the NMFS is publishing substantively identical proposed regulations codified in Chapter II of the same Title.

This joint proposal is summarized below, with cites to NMFS codification in parentheses:

1. Section 17.3 (§ 217.12) is amended by adding key terms used in section 7 and in this proposal.

2. The following sections of Subpart I—Interagency Cooperation (Part 223—Endangered and Threatened Fish or Wildlife—Interagency Cooperation) are added:

(A) A § 17.91 (§ 223.1) is added on the scope of section 7 of the Act. This section affirms the responsibilities of the Federal agencies under section 7 by directing them to carry out conservation programs for listed species, and requiring them to insure that their actions do not jeop-

ardize the continued existence of listed species or result in destruction or modification of critical habitat. The sections affirm that the prohibition against actions causing jeopardy applies extraterritorially.

(B) Section 17.92 (§223.2) describes the application of section 7 to previously initiated Federal agency actions.

(C) Section 17.93 (Subpart B—Consultation) sets forth procedures that the Federal agencies should follow in meeting the consultation and assistance requirements of section 7.

(1) The consultation process is to be initiated by Federal agencies after review and identification of actions that may affect listed species. If such review indicates no effect on lised species, consultation is not required unless requested by the FWS or NMFS. If a Federal agency identifes any action that may affect listed species, that agency should initiate consultation by written request to the appropriate FWS or NMFS official, with a copy to the Secretary of State if foreign countries or the high seas are involved. Additionally, consultation can be requested by either the FWS or NMFS should it become aware of a Federal action that may affect listed species and that has not received the benefit of section 7 consultation. Informal consultation at the field level between the FWS or NMFS and the Federal agencies can be initiated, but is not a substitute for the formal consultation process contained in this proposal. Federal agencies may obtain assistance from any source so long as they retain full responsibility for consultation.

(2) Consultation and assistance can take place in several forms.

(a) Consultation may be consolidated with interagency review under the National Environmental Policy Act (42 U.S.C. 4321 et seq.), the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.), and other appropriate statutes. However, such consolidation does not relieve the Federal agencies of complying with the consultation, procedures contained in this proposal.

(b) Consultation may be carried out through one Federal agency when several Federal agencies are in-

volved in a common activity or program, and the FWS or NMFS concurs in the arrangement.

(3) It is the responsibility of the affected Federal agencies to obtain the biological data necessary to evaluate the effect of an action. The FWS or NMFS will assist to the extent feasible when requested, but will not fund the basic study.

(4) Upon receipt of a written request for consultation from a Federal agency, the FWS or NMFS will conduct a threshold examination. A threshold examination is a preliminary assessment by the FWS or NMFS to ascertain if an action will adversely affect listed species or their habitat.

(a) If, in either Director's opinion, the Federal action will promote the conservation of listed species or their habitat, the Federal agency will be notified within 60 days of initiation, and further consultation will not be required unless additional consultation will benefit the listed species.

(b) If an action is not specifically for the conservation of listed species and the threshold examination reveals that listed species or their habitat will not be adversely affected, the Federal agency will be notified within 60 days of initiation, and further consultation will not be required.

(c) If the Federal action may adversely affect listed species or their habitat, the agency will be so notified in writing within 60 days of initiation, and a final biological opinion will be rendered within 60 days after receipt of information adequate for a biological opinion, unless special circumstances require that a longer period be negotiated.

(5) The consultation process is complete only when the FWS or NMFS has rendered a written biological opinion on the effect of the Federal action on listed species or their habitat. Such opinions and any recommendations will be accompanied by supporting facts and documentation. Upon receipt of the biological opinions and recommendations from the FWS or NMFS, it will then be the responsibility of the Federal agency to determine whether and how to proceed in light of its section 7 obligations.

(6) Consultation should be reinitiated on a Federal action if the Federal agency or FWS or NMFS obtains significant information not previously considered, if the Federal action is significantly modified, or if a new species is listed that is affected by the action.

(D) Section 17.94 (Subpart C—Determination of Critical Habitat) sets forth procedures for determining critical habitat and states criteria the FWS or NMFS will consider in making such determinations.

PUBLIC COMMENTS SOLICITED

The Director of the FWS, on behalf of the FWS and NMFS, hereby solicits written comments and suggestions from the public at large, concerned Governmental agencies, the scientific community, industry, private interests, and any other interested persons. It is hoped that such comments will expose any potential problems so that our final rules will be clear, equitable, and effective.

The final promulgation of these regulations will take into consideration the comments received. Such comments or other additional information may lead the FWS and NMFS to adopt final regulations that differ from this proposal.

SUBMITTAL OF WRITTEN COMMENTS

Interested persons may participate in this rulemaking by submitting written comments to the Director (FWS/LE), U.S. Fish and Wildlife Service, P.O. Box 19183, Washington, D.C. 20036. All relevant comments received on or before March 28, 1977 will be considered. The FWS, on behalf of both the FWS and NMFS, will attempt to acknowledge receipt of all comments, but may not respond substantively.

Comments received will be available for public inspection during normal business hours (7:45 a.m. to 4:15 p.m.) at the Office of the Associate Director for Federal Assistance, U.S. Fish and Wildlife Service, Department of the Interior, 18th and C Streets, NW, Washington, D.C. 20240.

This notice of proposed rulemaking is issued under the authority of the Endangered Species Act of 1973, 16 U.S.C. 1531–1543.

Dated: January 19, 1977.

NATHANIEL P. REED,
Assistant Secretary,
Fish and Wildlife and Parks.
ROBERT W. SCHONING,
Director,
National Marine Fisheries Service.

Accordingly, it is hereby proposed to amend Part 17, Subchapter B, Chapter I of Title 50, Code of Federal Regulations, as follows:

1. Add to the definitions of § 17.3, maintaining alphabetical order, the following:

§ 17.3 DEFINITIONS.

• • • • •

"Activities and programs" means all actions of any kind authorized, funded, or carried out by Federal agencies, in whole or in part, examples of which include, but are not limited to: (1) actions intended to conserve listed species or their habitat; (2) the promulgation of regulations; (3) the granting of licenses, contracts, leases, easements, rights-of-way, permits, or grants-in-aid; or (4) actions directly or indirectly causing modifications to the land water, or air.

• • • • •

"Critical habitat" means any air, land, or water area (exclusive of those existing man-made structures or settlements which are not necessary to the survival and recovery of a listed species) or any constituent thereof, the loss of which would appreciably decrease the likelihood of the survival and recovery of a listed species or a distinct segment of its population. The constituent elements of critical habitat include but are not limited to physical structures and topography, biota, climate, human activity, and the quality and chemical content of land, water, and air. Critical habitat may represent any portion of the present habitat of a listed species and may include additional areas for reasonable population expansion.

"Destruction or adverse modification" means a direct or indirect alteration of critical habitat which appreciably diminishes the value of that habitat for survival and recovery of a listed species. Such alterations include, but are not limited to those diminishing the requirements for survival and recovery listed in § 17.94(b). There may be many types of activities which could be carried out in critical habitat without causing such diminution.

• • • • •

"Federal agency" means each authority of the Government of the United States except for the Congress, the courts of the United States, the Governments of the territories or possessions of the United States or the Government of the District of Columbia.

• • • • •

"Jeopardize the continued existence of" means to engage in an activity or program which reasonably would be expected to reduce the reproduction, numbers, or distribution of a listed species to such an extent as to appreciably reduce the likelihood of the survival and recovery of that species in the wild. The level of reduction necessary to constitute "jeopardy" would be expected to vary among listed species.

"Listed species" means any species of fish, wildlife, or plant which is designated as endangered or threatened pursuant to the Act.

• • • • •

"Recovery" means improvement in the status of listed species to the point at which listing is no longer required.

2. Add §§ 17.91 through 17.94 of Subpart I, to read as follows:

SUBPART I—INTERAGENCY COOPERATION

§ 17.91 SCOPE.

This subpart interprets and implements section 7 of the Act. Section 7 (16 U.S.C. 1536) applies to all listed

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species of fish, wildlife, or plants and imposes three burdens upon the Federal agencies. First, it directs them to utilize their authorities to carry out conservation programs for listed species. Such affirmative conservation programs must comply with any applicable permit requirements of 50 CFR Part 17 for listed species. Second, it requires every Federal agency to insure that its activities and programs in the United States, upon the high seas, and in foreign countries will not jeopardize the continued existence of a listed species. And third, section 7 directs all Federal agencies to insure that their activities and programs do not result in the destruction or modification of critical habitat. Although the Fish and Wildlife Service and the National Marine Fisheries Service share responsibilities for the Act, the regulations in this subpart apply only to listed species under the jurisdiction of the Fish and Wildlife Service. A Federal agency can determine which Service to initiate consultation with by scanning the list of species under the jurisdiction of the National Marine Fisheries Service located at 50 CFR 222.23(a) and 227.4. If the Federal agency's activity or program may affect a listed species which is cited in 50 CFR 222.23(a) or 227.4, then the agency should initiate consultation with the National Marine Fisheries Service. If the listed species is not cited in 50 CFR 222.23(a) or 227.4, the Federal agency should initiate consultation, with the Fish and Wildlife Service.

§ 1792 APPLICABILITY TO PREVIOUSLY INITIATED ACTIONS.

Section 7 applies to all activities or programs where Federal involvement or control remains which in itself could jeopardize the continued existence of a listed species or modify or destroy its critical habitat.

§ 17.93 CONSULTATION.

(a) *Initiation.* (1) It is the responsibility of each agency to review its activities or programs and to identify any such activities or programs that may affect listed species or their habitat. Reviewing agencies may obtain advice from the Service, but this is supplemental to and not a substitute for the formal consultation process set

forth in this Subpart. Where a Federal agency funds or authorizes an activity or program to be carried out by a non-Federal entity, the Federal agency should initiate the consultation process and not the non-Federal entity.

(2) If a Federal agency decides that its activities or programs will not affect listed species or their habit the consultation requirements of section 7 will not apply unless requested by the Service.

(3) When a Federal agency identifies activities or programs that may affect listed species or their habitat, the agency should convey a written request for consultation to the Regional Director for the Region where the activity or program is or will be carried out or to the Regional Director for the Region where the Federal agency is situated if more than one Region is involved, or to the Director if foreign countries or the high seas are involved. In addition, if foreign countries of the high seas are involved, a copy of the request for consultation should be forwarded to the Secretary of State c/o the Director, Office of Environmental Affairs.

(4) In addition, the Director or Regional Director will request initiation of consultation if he identifies any activity or program of a Federal agency that has not received prior consultation and that may affect listed species or their habitat.

(5) Informal consultation may be initiated at the field level between the Service and the Federal agencies or their authorized representatives. Such informal consultation is supplemental to and not a substitute for the formal consultation process set forth in this Subpart.

(b) *Form.* (1) Consultation under section 7 may be consolidated with interagency cooperation required by other statutes, such as the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.) or the National Environmental Policy Act (42 U.S.C. 4321 et seq.). The satisfaction of the requirements of these other statutes, however, does not of itself relieve a Federal agency of its obligation to comply with the consultation procedures set forth in this Subpart.

(2) When par[illegible] programs or activities involve more than one Fe[illegible] agency [illegible]hese agencies may, with

concurrence of the Director, fulfill their consultation responsibilities through a single agency.

(c) *Assistance from the Service.* It is the primary responsibility of each Federal agency requesting consultation to conduct appropriate studies and to provide the biological information necessary for adequate review of the effect an activity or program has upon listed species or their habitat. To the extent it is able, the Service will upon request provide relevant available data and reports, personnel, and recommendations for additional studies or surveys, but the Service will not fund any such additional studies or surveys.

(d) *Assistance from other sources.* Federal agencies may seek assistance from any source to obtain the biological information necessary for review of the effect an activity or program has upon listed species or their habitat. Such assistance may include, but is not limited to that obtained by contract or required by regulations of the Federal agency. However, responsibilty for compliance with the procedures of this Section remains with the Federal agency and cannot be delegated by it.

(e) *Threshold examination.* Upon receipt of a request for consultation, the Director or Regional Director will conduct a threshold examination of the activity or program under review. A threshold examination may include a review of available information or an on-site inspection of the area.

(1) If an activity or program under review will, in the opinion of the Director, promote the conservation of listed species, the appropriate Federal agency shall be notified in writing within 60 days after consultation is initiated, and additional section 7 consultation shall be unnecessary unless it would further benefit the listed species. The Service, to the extent feasible, will assist in carrying out such programs if requested by the Federal agency. The Federal agency should be aware that in addition to satisfaction of section 7 requirements, a permit may be required for activities otherwise prohibited by section 9 of the Act (16 U.S.C. § 1538).

(2) If an identified activity or program is not specifically for the conservation of listed species, but the Director or Regional Director concludes from the threshold examination that in no likelihood will the activity or program jeopardize the continued existence of a listed species or result in the destruction or adverse modification of its critical habitat, the appropriate Federal agency shall be notified in writing within 60 days of initiation and further section 7 consultation shall be unnecessary.

(f) *Further consultation.* If an identified activity or program is not specifically for the conservation of listed species, and the Director or Regional Director concludes as a result of the threshold examination that the activity or program may jeopardize the continued existence of a listed species or result in the destruction or adverse modification of its critical habitat, the Federal agency will be so notified in writing within 60 days of initiation. The Federal agency, with assistance as feasible from the Service and other sources of expertise, shall then initiate biological surveys or studies to determine how the activity or program may affect listed species or their critical habitat. Within 60 days of receipt of adequate information and documentation, unless special circumstances require negotiation of a longer period, the Service will end consultation by issuing a biological opinion.

(g) *Biological opinions.* (1) If the Director or Regional Director concludes that an activity or program under review is not likely to jeopardize the continued existence of listed species or result in destruction or adverse modification of critical habitat, he will so notify the Federal agency in writing.

(2) If the Director or Regional Director concludes that an activity or program under review is likely to jeopardize the continued existence of a listed species or result in the destruction or modification of critical habitat, he will so notify the Federal agency in writing and may recommend any changes that in his opinion will eliminate these effects of the activities or programs.

(3) Biological opinions issued pursuant to paragraphs (g)(1) and (2) will be accompanied by a statement of the facts and documentation on which they are based.

(4) Upon receipt and consideration of the final bio-

logical opinion and recommendations of the Service, it is the responsibility of the Federal agency to determine whether to proceed with the activity or program as planned, in light of its section 7 obligations. Where the consultation process has been consolidated with interagency cooperation required by other statutes, such as the Fish and Wildlife Coordination Act (16 U.S.C. 661 et seq.) or the National Environmental Policy Act (42 U.S.C. 4321 et seq.), the final biological opinion and recommendations of the Service should be stated in the documents required by those statutes.

(h) *Reinitiation.* Consultation shall be reinitiated by the Service or by the Federal agency:

(1) If new information reveals impacts of an activity or program that may hinder the survival and recovery of listed species;

(2) If the activity or program is modified in a manner that may hinder the survival and recovery of listed species; or

(3) If a new species is listed that may be affected by the activity or program.

§ 17.94 DETERMINATION OF CRITICAL HABITAT.

(a) *Procedure.* Whenever deemed necessary and appropriate, the Director shall determine critical habitat for a listed species. After exchange of biological information, as appropriate, with the affected States and Federal agencies with jurisdiction over the lands or waters under consideration, the Director shall publish proposed rulemakings in the FEDERAL REGISTER. Comments of the scientific community and other interested persons will also be considered in promulgating final rulemaking.

(b) *Criteria.* The Director will consider the physiological, behavioral, ecological, and evolutionary requirements for the survival and recovery of listed species in determining what areas or parts of habitat (exclusive of those existing man-made structures or settlements which are not necessary to the survival and recovery of the species) are critical. These requirements include, but are not limited to:

(1) Space for individual and population growth and for normal behavior;

(2) Food, water, air, light, minerals, or other nutritional or physiological requirements;

(3) Cover or shelter;

(4) Sites for breeding, reproduction, or rearing of offspring; and generally,

(5) Ecosystems that are protected from disturbances and are representative of the geographical distribution of listed species.

(c) *Emergency determination.* Paragraphs (a) an (b) notwithstanding, the Director may make an emergency determination of critical habitat if he finds that an impending action poses a significant risk to the well-being of a listed species by the destruction or adverse modification of its habitat. Emergency determinations will be published in the FEDERAL REGISTER and will remain in effect for no more than 120 days.

[FR Doc. 77-2383 Filed 1-25-77; 8:45 am]

[1-200] [Exhibit No. 61 was filed.]

The COURT. Go ahead. You can proceed while he is looking.

Mr. WAGNER. Yes. Two slides as collective exhibit showing the transplant site above water.

[Exhibits Nos. 62 and 63 were filed.]

Mr. WAGNER. We are ready for Mr. Kimmons.

GEORGE H. KIMMONS, called as a witness by and on behalf of the defendant, after having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

By Mr. WAGNER:

Q. State your full name?

A. George H. Kimmons.

Q. Where do you live?

A. Route 3, Williams Road, Concord, Tennessee.

Q. How old are you?

A. Fifty-seven.

Q. By whom are you employed?

A. Tennesse Valley Authority.

Q. How long have you been employed by TVA?

A. Thirty-six years.

[1-201] Q. What capacity are you employed by TVA at the present time?

A. Manager of Engineering Design and Construction.

Q. Are you in charge of all of TVA's engineering design and construction?

A. Right.

Q. Approximately how many employees do you have working under your either direct or indirect supervision?

A. Fifteen or sixteen thousand.

Q. Where did you receive your educational training?

A. University of Mississippi.

Q. Did you get a BS there?

A. A bachelor of science in civil engineering.

Q. In what year?

A. 1941.

Q. Have you been in charge of the engineering design and construction of the Tellico Dam project?

A. Yes.

Q. Under your supervision is there also an accounting kept as to the amount of money spent and also as to the stage of completion at various stages?

A. Right.

Q. At the present time do you have any figures showing as of March 31, 1976 the stage of completion and the [1-202] amount of money that has been spent?

Mr. DOUGHERTY. Your Honor, for the record, the plaintiffs would object to any evidence introduced in this cause in connection with any financial matters, any matters relating to percentage of completion of the project, or the cost of the project with the money expended to date.

We feel that would open up the nature of the project to benefit-detriment costs and value thereof, and it is our feeling that is not a proper and competent issue for the Court to consider in connection with this particular litigation.

The COURT. Overruled.

Mr. DOUGHERTY. And that those values are not in any way, and cost figures, are not in any way part of the issues before you.

The COURT. Your objection is overruled. The Court will say what the issues are and what they are not, not counsel.

By Mr. WAGNER:

Q. Do you have a cost breakdown, Mr. Kimmons, that your office has prepared?

A. Yes, sir.

Q. Showing the construction status and fund obligation through March 31, 1976?

[1-203] A. Yes, sir.

Q. Do you have that in your possession?

A. Yes, sir.

Mr. DOUGHERTY. Your Honor, to avoid my objection further——

The COURT. The objection may stand.

Mr. DOUGHERTY. Note it as continuing.

The COURT. And it may continue as long as he testifies about this issue.

Now I don't want a detailed definitive——

Mr. WAGNER. There will be no detailed definitive testimony. It will be very brief.

By Mr. WAGNER:

Q. You have that in your possession at this time?

A. Yes, sir.

Q. Would you pull it out, please.

A. [Witness complies with request of counsel.]

Mr. WAGNER. We ask that be marked as an exhibit, please, and then returned to him so he can testify from it.

The WITNESS. I have some figures on there other than this for my own information.

Mr. WAGNER. Maybe mine can be marked and I will hand it back to you.

[1-204] (Exhibit No. 64 was filed.)

By Mr. WAGNER:

Q. Referring now to Exhibit 64, could you please tell us what the total obligations in the Tellico Dam and Reservoir are as of March 31, 1976?

A. $78,619,000.

Q. What about at the present time?

A. I would have to estimate that. I would say we have probably close to $80 million.

Q. Okay. What is the stage of completion at the present time?

A. Approximately 80 percent complete.

Q. What was the stage of completion as of March 31, 1976?

A. March 31, 1976?

Q. That would be 78.6 percent?

A. Approximately—yes.

Q. How many people are presently employed in the Tellico Dam and project?

A. Six hundred sixty-four, I believe.

Q. It is scheduled for completion in January of 1977; scheduled for closing in January 1977?

A. Scheduled for closure in January 1977; that is correct.

The COURT. Does that mean the water will [1-205] build up in the reservoir at that time?

The WITNESS. Yes, sir. There will still be work to do other than that but we hope to close the dam, start backing up water, in January 1977.

Mr. WAGNER. That is all.

The COURT. Take a short recess, Gentlemen.

[A short recess was taken, after which the following proceedings were had:]

The COURT. You may proceed with the cross-examination.

CROSS-EXAMINATION

By Mr. DOUGHERTY:

Q. Mr. Kimmons, as I recall your direct examination you are the Manager of Engineering, Design and Construction for TVA?

A. Right, sir.

Q. You are a civil engineer in essence?

A. Right.

Q. You are not a CPA nor an accountant?

A. No, sir.

Q. And the figures that Mr. Wagner referred to you are figures which were really prepared in detail by someone else and provided to you?

A. Oh, yes.

[1-206] Q. Now I would like to show you another document which is similar to the document which you were examining a minute ago which was prepared by TVA which has a few additions to it, and ask you to look at it—Mr. Marshal, if you will refer that to Mr. Kimmons—is that not a document also prepared by TVA?

A. That is correct.

Q. Just has some additions on the bottom?

A. That is right.

Q. And I believe was furnished by you to Mr. Wagner and Mr. Wagner was kind enough to give me a copy?

A. That is correct.

Mr. DOUGHERTY. Your Honor, may we file that as Exhibit No. 65?

[Exhibit No. 65 was filed.]

Mr. DOUGHERTY. Your Honor, for the record, so that I don't waive my objection, and it be understood my objection is continuing and I am not waiving my objection by cross-examining Mr. Kimmons.

The COURT. Correct.

Mr. WAGNER. What is that exhibit number?

The COURT. 65.

By Mr. DOUGHERTY:

Q. Do you have another copy of that document in front of you?

[1-207] A. Yes, sir.

Q. You have another document in front of you, the one that was just introduced as an exhibit which His Honor is looking at?

A. I have it here.

Q. Now, Mr. Kimmons, assuming, for example, that the dam were not closed and the project was concluded at this point in time, I believe TVA itself acknowledges first of all that there would be recoverable benefits in connection with the land that TVA has acquired either by purchase or condemnation?

A. That is correct.

Q. And at this point in time what do you contend TVA has expended? Is that the $78,619,000?

A. That is correct.

Q. As of March 31, 1976?

A. That is right.

Q. And on your own figures, TVA's own figures, you acknowledge that there would be recoverable benefits in connection with the land itself in the amount of $21 million?

A. That is correct.

Q. So if the project were stopped as of today, first of all, there would be recoverable quantities as far as the defendant TVA is concerned in the amount of at least [1-208] $21 million?

A. That is correct.

Q. Now when we talk about recoverable, what do you mean?

A. I mean the things that TVA can receive money from or benefits that I feel were needed if they had been no project there.

Q. Now let me ask you this, would you not agree that since TVA is a public agency and a corporation of the United States Government, that the concept of recoverable would also include those benefits or items which would render benefit to the public generally if the dam were not concluded?

A. To a certain extent I would agree with that, sir.

Q. And as far as the land itself, you would agree, would you not, for example, TVA could sell the land and in the event the dam were stopped as of today would recover at least $21 million in return?

A. Sir, I am not sure TVA could sell the land.

Q. Would you not also agree that TVA could possibly sell the land for much more than it acquired it for and possibly much more than $21 million?

A. No, sir, I would not agree to that.

Q. Would you not agree that since this land is [1-209] in close proximity to the Little Tennessee River, assuming that the dam were stopped as of today, that that land could be devoted to public use whether it was state or federal, in terms of parks, recreational area, and in that sense it would have a benefit recoverable to the public generally?

A. Possibly, yes.

Q. Now when you go down the next category, and let me just say this, under your own calculations you would reduce the figure that you call non-recoverable from $78 million down to $52 million?

A. Yes.

Q. All right. And are you saying by that that of all the other moneys expended that TVA and the public generally would not accrue any benefit from the money expended in the Tellico project outside of the purchase or condemnation of land?

A. No, sir, I am not saying that.

Q. Then in that connection, looking at category No. 3 on your chart dated March 31, 1976, Reservior Adjustments, Clearing, and Rim Treatment, that would include, would it not, roads and highways, federal and state, Monroe County roads, Loudon County roads, Blount County roads, and bridge removal, would it not?

A. That's right.

Q. It would also involve relocating of railroads [1-210] and railroad bridges?

A. Right, sir.

Q. And relocating and protecting other structures and improvements?

A. Right.

Q. And the clearing and rim treatment along the banks of the Little Tennessee River?

A. Right, sir.

Q. I believe you have also had prepared a document which you are presently looking at, and if I could ask that this exhibit be filed as a part of the record as Exhibit No. 66—it has already been marked by the Clerk——

The COURT. Received.

[Exhibit No. 66 was filed.]

By Mr. DOUGHERTY:

Q. [Continuing.] In connection with that document 66 which the Marshal is handing His Honor now, that is a document that has been prepared by your office?

A. That is correct.

Q. Which essentially shows the breakdown of the cost factors in categories of specifically the third item on your basic chart, Reservoir Adjustments, Clearing, and Rim Treatment;. correct?

A. Right.

Q. And Construction Supervision and Services, [1-211] General Engineering and Design, and General Administration?

A. That is right.

Q. Does it include any other breakdown in terms of cost?

A. It includes some breakdowns of the estimated cost of certain roads, in the reservoir.

Q. All right.

In that connection, Mr. Kimmons, would you not agree that in connection with the $4 million spent in the improvement of federal and state highways in connection with the Tellico project, that those highways would still have considerable benefit and utility as far as the public generally if the dam were stopped as of today?

A. Yes, I would agree that they would have benefit, but I would like to state that if the reservoir was not built the cost of these highways would be much, much less.

Q. All right.

Are you saying that TVA spends more money than it should on some of its projects?

A. I am saying that it would not have been necessary to build the 411 bridge as high as it is had there not been a reservoir proposed there. It would have been built, the abutments would have been much less, the price of the bridge would have been about half of what it is now.

Q. Is it not a fair statement, though, that the [1–212] only factor we are talking about there is that the bridge would not have to be as high as it is now?

A. That is a big factor and that is the factor, that is correct.

Q. But is it not a factor that of that $4 million in the category of Federal and State Highways, that at least in terms of your own estimate, that at least half of that would accrue to the benefit of the public generally if the dam were stopped as of today.

A. That is correct.

Q. So then your figure of $21 million would have to be increased first of all by that figure of at least $2 million in connection with Federal and State Highways?

A. That figure is included in the next figure below, the $21 million that you see there, $4,650,000.00.

Q. And you are contending that only $2 million of that figure would be in essence accruing to the public generally?

A. Due to this one particular bridge that we are talking about, the 411 four-lane highway bridge.

Q. Now in connection with the Monroe County roads, the Loudon County roads, the Blount County roads, is it not a fact that those roads would accrue to the benefit of the public generally in the areas where those roads are located?

[1-213] A. They were roads to serve the public where needed in the reservoir. These roads that we have built were built only to take care of the traffic due to the reservoir.

Q. Is it not a fact some of the roads that were already there were perfectly usable for the people that have used the area and engaged in trout fishing in the area, for example, over the years?

A. That's the point I am trying to make, sir. The roads were adequate for the people there had there not been a reservoir.

Q. And is it not a fact that those roads which you have constructed, and for example, Monroe County, Loudon County

and Blount County, have in essence replaced and in some sense actually cut off the old roads that were in existence?

A. They have cut off the old roads in existence only because of the reservoir location.

Q. Is it not a fact that the cost of constructing and relocating the railroad bridge would accrue to the public generally and to the L & N Railroad in connection with the construction of that bridge?

A. Absolutely not. As far as I can see there was an adequate bridge there that served the L & N and the public for years, and I could see no need of building a new [1–214] bridge there.

Q. Is it not a fact that there were certain problems with that bridge that would have required renovation or construction work at some point in the near future?

A. This I have no knowledge of.

Q. So you really have no personal knowledge about that?

A. I have no personal knowledge of the L & N Railroad bridge.

Q. Is it not also a fact that certain of the clearing, and work along the river banks, assuming the dam were stopped as of today, would also accrue to the benefit of the public in terms of making better access and public use facility areas for the public that would use the little Tennessee River?

A. I think it would be possibly a detriment to the public.

Q. And you are saying that is the case even though these banks are supposedly seeded and grassed?

A. Yes.

Q. Isn't it a fair statement, Mr. Kimmons, that in reality the figure of $23 million which you have given as an accounting basis for the reservoir as far as Reservoir Adjustments, Clearing, and Rim Treatment, the item in that category, that approximately 80 percent of that figure would [1–215] be recoverable to the public generally if the dam were stopped as of today?

A. No, sir, not 80 percent of the $23,430,000.00, if I understand your question correctly.

That consists of so many roads, and the only thing I have in that category is $4,650,000.00.

Q. In connection with the federal and state highways?

A. In connection with the federal and state highways.

Q. Now you would admit though that the figure that is on the document provided by TVA in the amount of $52 million

is not precisely correct when you consider the concept of recoverable as being applicable to the public generally and not just TVA?

A. Yes, I would have to agree with that.

Q. Now, Mr. Kimmons, going down to the factor of Construction Plant, Equipment, and Inventories, which is No. 5, I believe, on your chart, would you not agree that if the dam were stopped as of today that a large portion of that equipment could be sold and some of that equipment has appreciated in value in terms of construction equipment market as of today, particularly bulldozers, things of that sort?

A. All of the equipment has depreciated in value. [1–216] If the dam were stopped today I am sure that we could sell the equipment. We could possibly use it somewhere else.

Q. When you say depreciated, are you not saying that in terms of an accounting basis as opposed to a fair cash market sales basis?

A. I am not familiar enough with the sale of equipment, used equipment, to be able to answer that for you.

Q. Would you not agree, for example, that a Caterpillar D–8, the price of a Caterpillar D–8 has been constantly escalating and even a used D–8 would sell for considerably more than possibly it was purchased for maybe two or three years ago?

A. I don't think I could agree with you on that, sir.

Q. You haven't any specific knowledge concerning that?

A. No specific knowledge but I do know that we are getting a lot of competition in tractors now from outside of the United States and places.

Q. Are all of the items of equipment, for example, bulldozers and equipment of that sort owned by TVA?

A. Yes.

Q. As opposed to renting them?

A. There may be a few exceptions but generally [1–217] speaking the equipment is owned by TVA.

Q. Now turning to the category of Construction Supervision and Services, General Engineering and Design, and General Administration where you have a figure of $10-million.

A. Yes, sir.

Q. Would you not agree that in those areas where you do acknowledge that there are costs accruable to the public generally, and in essence recoverable, that the Construction Supervision and Services in those costs would also be in essence recoverable and accruable to the public?

A. I would not—had there been no project, had there been no project or the project be stopped, this money would not have been spent.

Q. Let me ask you this: Is it not a fact that at the inception of the project there was considerable engineering work and design and this sort of thing that went on in the beginning, possibly several million dollars in amount that was engaged in prior to any approval of the project or funds being appropriated by Congress and if the dam, for example, had not been appropriated funds by Congress, that money, for example, would have gone down the drain?

A. We could not have started the design of the project until after we had received appropriations from [1–218] Congress. We have no money available to work on a project of this nature until such time as Congress appropriates the money.

Q. Would you not agree that a number of people that you have employed in connection with the design and construction of this project would have been employees of TVA anyway and been engaged in other projects if they had not been engaged in this project?

A. That is entirely possible.

Q. So you would agree that there are probably costs in that regard that would be recoverable to the project and the public generally in that connection?

A. I can't agree with you on that.

Q. Again, you don't profess to be an accountant in terms of—

The Court. He said that, Mr. Dougherty. Go ahead, get on something else.

Q. Now in conclusion then you would agree that the figure of $52 million that is on your exhibit, which I indicated to you was recoverable in terms of TVA's own estimate, is in essence incorrect and that the figure is at some point lower than that?

A. I would not agree. This is my best estimate at this time, in the way we see it from an engineering standpoint, TVA's figure.

[1–219.] Q. Of course, this is based on information that has been provided to you?

A. Yes.

Q. And is based really on conclusions that have been formed by someone else other than yourself?

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A. Figures supplied to me but conclusions arrived at by me.

Q. Is it not a fact that if the Little Tennessee River area were put into alternative uses, let's say, in terms of public state parks, for example, that these roads which you have built going to those areas would obviously be accruable to the public generally in terms of providing public access to those areas?

A. I do not think that these roads would be adaptable to any use other than for a reservoir.

The location of these roads were provided so as to move the people around and adjacent to the reservoir. With no reservoir there the roads would necessarily need to be moved closer to the river or the old existing road used.

Q. Well, at the most we are talking about several hundred feet?

A. Oh, no. We are talking about many miles in some cases.

Q. I am talking about in terms of where these roads go into the public area that TVA has acquired.

[1-220] A. Oh, yes. All right.

Q. So in sense of the land that TVA has acquired by condemnation or purchase, if all that property were devoted to public use the roads would then be used and could serve those areas that we are talking about?

A. That's correct.

Q. And if, for example, the state or some other agency, including TVA, developed these as park facilities for the public, the fact that it is a reservoir or a river like the Little Tennessee River, would still be a benefit to the public, the roads that TVA constructed?

A. Yes.

Mr. DOUGHERTY. I think that is all, Your Honor.

Mr. WAGNER. Your Honor, just a few——

The COURT. Gentlemen, we just cannot criss-cross these witnesses. They are entitled to some consideration too.

Now if you have anything new and will go right to it, I will let you ask it, but don't ask it, please, unless it is new.

Mr. WAGNER. Just a couple of questions, if I might, Your Honor.

The COURT. Do they involve new matters?

Mr. WAGNER. I think so, Your Honor. They [1-221] are to me.

Mr. DOUGHERTY. May I ask one question and I will conclude.

By Mr. DOUGHERTY:

Q. In connection with the money that TVA has to spend from this date forward to conclude the project, the dam were stopped as of today, is it not a fact that TVA would not have to spend approximately $23-million?

A. I believe the figure to complete the dam and the project is approximately $20-million. If the project was stopped today TVA would have to spend quite a bit of that $20-million doing something with the equipment, so on. We would have some expense.

Q. Of course, you are not acknowledging that you would possibly receive certain financial returns from the sale of the equipment, the other matters that you would be dealing with?

A. It costs money to sell these.

Q. But now is it not a fact that possibly in selling these items of equipment you could also accrue and receive in that return the costs which have been involved?

A. Some costs, yes.

Q. Well, the point is, just in terms of the amount of money that TVA would have to spend from this date forward if the project were stopped as of today, there is [1-222] presently budgeted approximately $20-million.

A. That is correct.

Mr. DOUGHERTY. All right.

REDIRECT EXAMINATION

By Mr. WAGNER:

Q. Was the road system adequate without a reservoir, without any of TVA's improvements?

Mr. DOUGHERTY. Your Honor, I must object. I don't think that is the point. The question is whether the road is now——

The COURT. Well, I will let him answer because you have gone into so many things, so many things.

Mr. DOUGHERTY. All right, Your Honor.

The COURT. I told you and I told your adversary——

Mr. WAGNER. I will withdraw the question.

The COURT. I don't want all this. That is all, Mr. Witness. That is all.

The WITNESS. Thank you.

The COURT. I let one ask one question and the other wants to ask five.

[Witness excused.]

The COURT. Call your next witness.

[1-223] DR. THOMAS H. RIPLEY, called as a witness by and on behalf of the defendant, after having been first duly sworn, was examined and testified as follows:

Mr. PEDERSEN. To save time questioning I thought I would tell the Court that this is Dr. Thomas H. Ripley——

The COURT. That's the way to do it.

Mr. PEDERSEN. TVA employe, resident of Knoxville, Tennessee, forty-eight years old. He is Director of TVA's Forestries, Fisheries and Wildlife Development Division headquartered at Norris, Tennessee.

He is a graduate of the Virginia Polytechnic Institute in forestry, holds a master's degree in wildlife management from the University of Massachusetts, and a doctoral degree from V.P.I. in biology.

He's the author of about fifty articles and papers published in various professional and scientific journals. Listed in American Men of Science and Who's Who in America, and in 1976 was elected a Fellow to the Society of American Foresters.

The COURT. Is he running for anything now?

Mr. PEDERSEN. I think he is going to run for president.

[1-224] [Laughter in the courtroom.]

Mr. DOUGHERTY. He should run for Congress.

Mr. PEDERSEN. I would like to file as an exhibit a biographical sketch in more detail of Dr. Ripley.

The COURT. Received.

[Exhibit No. 67 was filed.]

DIRECT EXAMINATION

By Mr. PEDERSEN:

Q. Describe to the Court, Dr. Ripley, what your experience was after you finished school and before you came to TVA; what was the nature of your work, in as brief a compass as possible, please?

A. Over a period of about eight to ten years it was principally in research in forestry and forest wildlife subjects.

Mainly I was with the Forest Service based out of Asheville, North Carolina, and continued that work and then moved into research administrative positions with the Forest Service which I held up until, oh, for a period of about from 1966 to 1969, the last two years of which were in Washington, and then I came with the TVA in 1969.

Q. Will you describe your present duties with the TVA?

[1-225] A. Yes. I am an administrator responsible for the forestry, fisheries, wildlife, recreation programs for TVA.

Q. Are you an ichthyologist?

A. No, sir, I am not.

Q. What expertise, if any, do you have in fishes?

A. I have had a few general courses in college that related to fish management. I think I had a course in ichthyology as an undergraduate.

I don't recall exactly, but I am certainly not a specialist in this field.

Q. What type of a staff do you have under your command in the line of professional experts who do the technical scientific work for you?

A. Well, the work of the division is distributed into approximately, well, into four areas, one of which is the Land-Between-The-Lakes, and then there's the fisheries and waterfowl program, of forestry, and so on, wildlife program and recreation program, and in these there are many professional disciplines represented.

Q. And do you have ichthyologists on your staff?

A. Yes, we have a number.

Q. You have a number, you say?

A. The total professionals at the present time numbers about 180 in the division. There are about 80 of [1-226] these in fisheries or closely related aquatic fields in our program.

Q. Essentially, your work is administrative, I take it, is it not?

A. Yes.

Q. And at the request of the Department of the Interior were you designated as TVA's liaison officer coordinating the work of TVA with the Fish and Wildlife people?

A. Yes, I was.

Q. I will hand you here a letter dated December 24, 1974 from Mr. Seeber to the Director of the Fish and Wildlife Service.

Mr. DOUGHERTY. We will stipulate to that, Your Honor.

Mr. PEDERSEN. File that as an exhibit.

The COURT. Received.

[Exhibit No. 68 was filed.]

By Mr. PEDERSEN:

Q. When did the existence of the snail darter come to your attention, and how?

A. Specifically, the first knowledge that I recall having of the snail darter was when my assistant, Dr. Holland, called my attention to a request from Dr. Etnier at the University of Tennessee for support for studies [1-227] concerning a fish which he had found in the Little Tennessee River. That was in November 1973.

Q. A copy of that plan came to your attention, did it; did Dr. Etnier submit a plan and did you review it and did others review it?

A. Yes, I reviewed the plan.

Q. That has already been filed as an exhibit in the case and need not be further discussed now. And then the arrangement was made with the University of Tennessee, I take it, by contract; is that correct?

Mr. DOUGHERTY. Your Honor, we will stipulate that that took place.

The COURT. All right.

Mr. PEDERSEN. All right.

By Mr. PEDERSEN:

Q. Now, in addition to this plan to study the life and biology, and so forth, you had with the University, did you construct your own plan, a TVA plan to conserve the snail darter?

A. Yes, we did.

Q. In brief compass how did that come about and who participated in it?

A. The plan I would say had its beginning in the work which had been undertaken, or was being undertaken by the University, in recognition of what was thought to be a [1-228] new fish.

There were suggestions in the University plan which we felt were sound, including the effort to transplant, effort should be made to transplant it. Several rivers were mentioned, so that from the beginning of our review of the University plan we began to examine the possibilities of what TVA might do to augment that, to increase efforts, to if indeed the fish became listed as an endangered or threatened species, we felt that transplant was a viable alternative thing to do.

So we were considering as early as late 1973 and early 1974 things that might be done.

We discussed these matters with biologists, including Fish and Wildlife Service biologists and administrators, and concluded that a transplant, a surge program was in order and we did begin planning and undertaking this by late spring or early summer 1975, I believe.

Q. I hand you here a document, the program to conserve the snail darter, dated November '75, and ask you if that is the——

Mr. DOUGHERTY. Your Honor, we would have no objection to the document itself. We would object to any evidence in connection with the transplant. We do not feel that is material as far as the statutory violation and the problems under the [1-229] Endangered Species Act.

The COURT. The Court is overruling the objection but that doesn't mean the Court feels you are wrong on that point, but I don't want to take any chances and I am acting conservatively.

I am letting all of this go into the record and when I have a chance to sit down and go over the record carefully, then I will have to decide the case, and I say that you may be entirely right about this being irrelevant.

I take it that this proof is introduced for one purpose and only one purpose, and that is for what bearing it may have on the good or bad faith of TVA in dealing with the project.

Mr. DOUGHERTY. And if my objection may be noted as continuing so I don't have to make it again.

The COURT. Yes, sir, it may be.

A. Yes.

By Mr. PEDERSEN:

Q. Then did you, well, was this plan reviewed by Dr. Raney also?

A. Yes.

Q. And did you yourself go about organizing the team and the equipment and things necessary to put the program into action or did that fall to somebody else?

[1–230] A. I participated in the overall planning for it but the work was assigned to the fisheries program.

Q. Who is immediately under your command?

A. Mr. Chance, who is chief of the fisheries branch at that time.

Q. And then beneath him?

A. The work was assigned to project leader Richard Fitz.

Q. He is the one who ultimately did the physical arrangement for carrying out the project; is that correct?

A. Yes. He led the project.

Q. What was the nature or type of team or equipment, could you just give us a little flavor of that? How many divers and equipment, or anything like that, or was this out of your knowledge?

A. Initially the team consisted of three men, I believe. We added personnel to that in the need to make the transplants, we had to put on additional people.

I think total staffing for that project reached and is now at twelve people, about half of whom are professional biologists of various, from various disciplines.

Q. Do these biologists themselves do the diving and go down and look for the fish?

A. Yes. In our search programs we are using six divers, a total of six divers. In the total team six [1–231] of the men are qualified scuba divers in our searches for the fish in the main Tennessee River at various locations, and there are, I believe all of them have professional degrees. Several have degrees in biology.

The COURT. Were they able to find any girl fishes and boy fishes?

The WITNESS. Your Honor, they claim at close range they can tell the difference.

The COURT. Do the girl fish keep their eyes on the watchers?

The WITNESS. Yes, sir, I suppose they do.

The COURT. The boy fish pays no attention.

[Laughter in the courtroom.]

Mr. PEDERSEN. By way of background we showed a little film showing——

Mr. DOUGHERTY. That is highly significant, Mr. Pedersen would say.

By Mr. PEDERSEN:

Q. To wrap it up without too many words, have you had meetings at various times, at various places with various people from the Fish and Wildlife and from Washington and Atlanta and Norris and elsewhere?

A. Yes, we have. We have had several meetings and there has been a rather substantial exchange of letters. In fact, I made a quick count, some forty letters, [1–232] approximately, that I know of in our file that have exchanged, and there have been innumerable telephone calls.

There is a two-man office, Fish and Wildlife Service office in Norris in our building, and, of course, there is practically daily contact between the biologists in that office and members of our fisheries staff.

Q. With respect to this transplant program, how early in the game was this transplanting of fish ever discussed with anybody in command in the Washington office, if it was? Was the matter of transplanting fish ever discussed up there and about when was that, if you recall?

A. Yes, it was discussed, and I recall that it was done at the time we had a federal agency meeting, which I recall to be May 29, 1975.

The Fish and Wildlife Service, and I think the National Marine Fisheries Service brought together the federal agencies for a discussion of the implementation of this Act of 1973, and at a luncheon meeting, which I had with a Mr. Keith Schriner, we discussed with him that we had been considering a transplant operation. I believe I mentioned that Dr. Etnier had suggested this in his earlier proposal.

I'm not exactly sure of the details, but we told him we felt it was a good idea; we thought the chances for success was high and would want to try it and what did [1–233] he think of it.

And as I recall, I don't remember his words exactly, but he said, indicated that——

Mr. DOUGHERTY. Your Honor, I would object as hearsay.

The COURT. As I understand he was representing the Department of the Interior, the man you were talking to?

The WITNESS. Yes, sir. He was——

The COURT. Since you have gone into that I will let him but try to confine it. We are spreading out too much, Mr. Pedersen. We are going into too much detail.

Let him do that and let's bring this thing to an end.

Mr. PEDERSEN. All right.

By Mr. PEDERSEN:

Q. This Mr. Schriner, what was his office and position with Fish and Wildlife?

A. He is assistant director of the Fish and Wildlife Service for Federal Programs.

Q. And he approved the basic——

A. He said he thought it was a good idea, words to that effect.

Q. Then you had many other meetings with him and [1-234] you had Mr. Williams down there and took him on a tour with a helicopter, is that right, of the project?

A. Yes, that's correct. I don't recall the date exactly but that is correct.

Q. Then you had other meetings and conferences with him at other places?

A. Yes, we have had a number of meetings.

Mr. PEDERSEN. We have some of these documents which at the conclusion of this we would like to file as exhibits without taking too much of the Court's time in questioning about them.

The COURT. Well, can you and Mr. Dougherty agree on it? If he objects to it you will have to do it now.

Mr. PEDERSEN. These were all filed and marked and shown to counsel, they have all been marked.

Mr. DOUGHERTY. If these are the documents that we have already gone over, I don't have any objection to them.

The COURT. All right.

Mr. PEDERSEN. There are a whole lot of those and we will just put them in at the end of this to save time.

The COURT. All right.

[1-235] By Mr. PEDERSEN:

Q. Among those have you been furnishing them with biweekly reports of everything you are doing in your conservation program?

A. We have been doing that for a couple of months.

Mr. PEDERSEN. Yes. I would like to file here the first one of March 2, 1976.

The COURT. Received.

Mr. PEDERSEN. And another one later, March 12, 1976; another letter, March 23, 1976.

Mr. DOUGHERTY. We have no objection to those.

Mr. PEDERSEN. And another one, they are all marked, March 25, 1976; April 13, 1976, April 27, 1976.

[Exhibits Nos. 69 through 74 were filed.]

By Mr. PEDERSEN:

Q. Now Dr. Ripley, there was testimony in this case——

The COURT. You can't ask a question of that kind. You can give him a hypothetical question if you want to, but don't tell him what the testimony is because the witnesses have been under the Rule and that is the purpose of the Rule, not to let one [1-236] witness know what the other witnesses have testified to.

By Mr. PEDERSEN:

Q. Did you have a discussion or meeting, conversation, with Dr. Williams in March of 1975; was that the time you went on the helicopter tour?

A. Yes, concerning the—concerning the question of siltation in the Little Tennessee River; yes, sir.

Q. Was anything said there or did you say anything with respect to the question of whether the snail darter, rather the impoundment of the Tellico Reservoir would destroy the snail darter?

A. I don't recall that I did. I don't recall discussing whether the impoundment itself, the effective impoundment itself. The discussion——

Q. Was that date before or after the discovery of the darter in the Watts Bar Reservoir and Chickamauga Reservoir, do you recall that?

A. This was before.

Q. That was before?

A. Yes.

Q. But you don't remember having any conversation with him as to whether the——

Mr. DOUGHERTY. Your Honor, he has asked him——

[1-237] The COURT. You have asked him that, Mr. Pedersen.

Mr. PEDERSEN. All right.

That completes our direct examination. We would like to, at the end of it, get these other exhibits filed.

The COURT. All right.

CROSS-EXAMINATION

By Mr. DOUGHERTY:

Q. Do you recall the hearing we had in this cause in connection with the temporary injunction on February 25, 1976?

A. Yes.

Q. I believe you were here in the courtroom that day?

A. Part of the time, I think.

Q. Isn't it a fact that TVA and its representatives attempted to quash the subpoena that had been served on Dr. Jim Williams by the plaintiffs and prevent him from testifying in this case before His Honor?

A. I am not aware of any such thing as that.

Mr. PEDERSEN. Wait just a minute.

The COURT. I'm not going to pay any attention to that. Go ahead. Go on to something that is [1-238] material.

Mr. DOUGHERTY. The only point I am making——

The COURT. I know the point but you are not trying this before a jury. I know, and go on to something else. Don't argue with the Court.

By Mr. DOUGHERTY:

Q. You are not an ichthyologist?

A. No, sir.

Q. You are basically a forester?

A. Forester, wildlife management.

Q. And you do not consider every person who has a degree in biology an ichthyologist?

A. No, sir, certainly not.

Q. And isn't it a fact that on the staff that TVA has that is under your supervision and those involved with the snail darter and fishes, that there is not a single PhD ichthyologist among that group?

A. Well, there are a number, in fact I think there are eight PhD's in fishery biology, and this is a, very—I am not sure how to cut the line, but ichthyology and fisheries science at that level, at the doctoral level, would be——

Q. I am talking about people who specialize in taxonomy or systematics?

A. No.

[1-239] Q. In the field of ichthyology?

A. No, we do not have a taxonomic ichthyologist. We do have Dr. Raney who has worked with us for many years.

Q. Dr. Raney is not a TVA employee, is merely a consultant employed by TVA to participate in this particular case?

A. No, sir. He is not a TVA employee but he consults with us not on this particular case but on a good number of cases.

Q. He has consulted with TVA on a few other matters but in this connection he is involved as a consultant in connection with the snail darter matter?

A. Yes, in this connection he is.

Q. And he is not a TVA employee?

A. And he is not a TVA employee.

Q. The point I am getting at, you do not have any PhD's in ichthyology who specializes in taxonomy or systematics?

A. No Ph. D?

Q. Yes.

A. In taxonomy, ichthyologist specializing in taxonomy. That's correct.

Q. And isn't it a fair statement that really of the people that have been participating in the snail darter program who are employed by TVA, that probably two of those [1-240] people at the most really have any intimate detailed knowledge of the entire program?

A. No.

Q. I am talking about field knowledge and laboratory knowledge?

A. I would say there would be three or four.

Q. Three or four at the most?

A. Four or five.

Q. Using your figures.

A. There are several biologists on Mr. Fitz's crew that have an intimate knowledge of this program, and I would certainly think that they would be included in that circle.

Now several of these have——

The COURT. Please, Doctor, let's don't go into—I have heard all I want on that. Let's go to something else.

By Mr. DOUGHERTY:

Q. Now in connection with the meeting in March of 1975 when Mr. Williams, or Dr. Williams, came down and you took him on a helicopter tour of the Little Tennessee River, he came down specifically to examine this clear-cutting operation, clearing the banks of the Little Tennessee River?

A. He came down to evaluate the timbering [1-241] operation, yes.

Q. And as related to the clear-cutting and timbering having an effect on siltation and sedimentation in the Little Tennessee River?

A. Yes.

Q. And is it not a fact that after he returned to Washington you represented to him that there would not be clear-cutting to the actual banks of the Little Tennessee River so as to cut down and decrease the effect of siltation and sedimentation in the Little Tennessee River?

A. No. He was down here, we were making a salvage, a timber salvage sale, and that's what he inspected, and I don't recall making any—I described to Dr. Williams as best I could what would take place.

I think it was well known to him, he had written earlier for information concerning these timber sales.

I don't recall making any statement——

The COURT. Now, Doctor, the answer is no, and please, I don't want to be disrespectful to you but don't go into details.

When he asks you a question and you can answer it yes or no, do that, and then if you have to make a relevant explanation I will hear you. But let's just try to answer yes or no.

[1-242] The WITNESS. All right.

By Mr. DOUGHERTY:

Q. You deny telling Dr. Williams that the clear-cutting would only be in certain selected areas and would not be covering the entire bank area of the Little Tennessee River?

A. Only where the timber was.

Q. Isn't it a fact that thereafter TVA began a wholesale clear-cutting of the entire length and breadth of the Little Tennessee River?

A. Dr. Williams understood that base and clearing—I am sure he understood that base and clearing would follow the

timber sale which he saw going on when he was down there in March.

Q. Would you not agree that you did not communicate that to Dr. Williams?

A. No, I would not agree.

Q. Now in that meeting of March 1975 that we referred to, you are not saying you did not say to Dr. Williams that the closure of the Tellico Dam and creation of the reservoir would not destroy the snail darter; you just don't recall that conversation?

A. I don't recall discussing the closure of the dam with respect to the snail darter, no.

Q. You are not saying under oath that that [1-243] conversation did not take place.

A. No. I am saying I don't recall.

Q. Is it not a fair statement that in the communications you have had with Dr. Williams and the Office of Endangered Species, that really all you have communicated with him about has been the transplanting operation and you have not really at any time ever considered any alternative plans to the project as far as the snail darter in the Little Tennessee River?

A. We have not discussed alternative plans. I recall no discussion of alternatives—you are talking about alternative plans to the project?

Q. Yes.

A. There has been no discussion of that with Dr. Williams that I recall.

Q. Nor has TVA conducted or made any studies in that particular area?

A. Alternative studies? I am not aware of any.

Q. All right. And isn't it a fact that TVA has taken no action to insure that the closure of the dam and the creation of the reservoir would not jeopardize the snail darter and destroy or modify its critical habitat in the Little Tennesese River?

A. No. On the contrary, I think TVA's effort to transplant the fish to another location is a positive [1-244] effort with respect to the snail darter.

Q. With regards to the destruction or modification of its habitat in the Little Tennessee River?

In other words, what I am asking, has TVA taken to avoid and prevent the destruction or modification of the habitat of

the snail darter in the Little Tennessee River, you have taken none, isn't that correct?

A. Well, until closure there is no modification that in our opinion that could be, would be significant with respect to that habitat.

Q. Would you not agree that upon closure and the creation of the reservoir that necessarily modification and destruction of that habitat would occur?

A. Modification, certainly.

Q. And modification such as to affect the habitat of the snail darter adversely?

A. I could not be sure.

Q. But you would agree that that was a strong possibility or probability at least that far?

A. I would be sure that it would modify it, and I don't know what effect the total—what the net effect might be.

Q. Isn't it a fact that TVA did not send any of these bi-monthly reports to the Office of Endangered Species until after this lawsuit was filed?

[1–245] A. The bi-monthly reports that Mr. Pedersen just referred to, these grew out of an agreement at a consultation meeting which we had with the Fish and Wildlife Service around the first of the year.

Prior to that we had prepared a single rather comprehensive report of activities, and I believe that was sent to all interested parties sometime after the first of the year.

Q. All I am asking you, Dr. Ripley, is it not a fair statement that the bi-monthly reports did not start going to the Office of Endangered Species until about the time this lawsuit was filed?

A. I don't believe there's any relationship between the two although except for time.

Q. You would agree it was about the same time period?

A. Yes, I guess so.

Mr. DOUGHERTY. I think that is all, Your Honor.

The COURT. That is all, Doctor.

[Witness excused.]

Mr. PEDERSEN. Your Honor, I want to file some more of these documents. They have already been stamped and shown to other counsel. One of December 26, 1974.

[1–246] Mr. DOUGHERTY. Are these the exhibits we have gone over together?

Mr. PEDERSEN. Yes, and they are stamped.

The COURT. Received.

[Exhibit No. 75 was filed.]

Mr. PEDERSEN. A memo from Fitz to Chance dated April 1, 1975.

[Exhibit No. 76 was filed.]

Mr. PEDERSEN. A letter from NEPA to Interior.

[Exhibit No. 77 was filed.]

Mr. DOUGHERTY. Your Honor, why don't we file them as a collective exhibit rather than having them mark each one. I would agree with that.

The COURT. You will get in trouble with the court reporter.

Mr. PEDERSEN. Well, you can't refer to them, you know, specifically, be a tremendous problem.

And a memo of July 9, 1975 from Fitz to Jaco.

[Exhibit No. 78 was filed.]

Mr. PEDERSEN. A letter of March 12, 1975 from TVA to Nathaniel Reed.

[Exhibit No. 79 was filed.]

Mr. PEDERSEN. A letter of August 16, 1975 to Director, U.S. Fish and Wildlife Service.

[1–247] [Exhibit No. 80 was filed.]

Mr. PEDERSEN. A letter from Ripley to Skoog August 20, 1975.

[Exhibit No. 81 was filed.]

Mr. PEDERSEN. A letter of September 15, 1975 from Ripley to Skoog.

[Exhibit No. 82 was filed.]

Mr. PEDERSEN. Memorandum of October 22, 1975, Fitz to Chance.

[Exhibit No. 83 was filed.]

Mr. PEDERSEN. A letter of October 17, 1975, Ripley to Skoog.

[Exhibit No. 84 was filed.]

Mr. PEDERSEN. Letter of November 20, 1975, Lynn Seeber to Greenwalt.

[Exhibit No. 85 was filed.]

Mr. PEDERSEN. A letter of December 1, 1975, Ripley to Williams.

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[Exhibit No. 86 was filed.]

Mr. PEDERSEN. Letter of December 11, 1975, Ripley to Skoog.

[Exhibit No. 87 was filed.]

Mr. PEDERSEN. A letter of January 22, 1976, Ripley to Black.

[Exhibit No. 88 was filed.]

[1-248] Mr. PEDERSEN. Letter, January 30, 1976, Ripley to Director, U.S. Fish and Wildlife Service.

[Exhibit No. 89 was filed.]

Mr. PEDERSEN. A letter, January 30, 1976, Ripley to Skoog.

[Exhibit No. 90 was filed.]

Mr. PEDERSEN. File memo, January 30, 1976, Charles J. Chance.

[Exhibit No. 91 was filed.]

Mr. PEDERSEN. A letter, December 24, 1975, Ripley to Greenwalt.

[Exhibit No. 92 was filed.]

Mr. PEDERSEN. Memo, Febraury 2, 1976, to the Associate Director of Federal Assistance.

[Exhibit No. 93 was filed.]

Mr. PEDERSEN. A letter of February 19, 1976, to the Director of Fish and Wildlife.

[Exhibit No. 94 was filed.]

Mr. PEDERSEN. That's from Lynn Seeber.

A telegram of February 2—I mean February 15, 1976, to Keith Schriner from Ripley.

[Exhibit No. 95 was filed.]

Mr. PEDERSEN. Letter, February 18, 1976, to Ripley from Regional Director, Fish and Wildlife.

[Exhibit No. 96 was filed.]

[1-249] Mr. PEDERSEN. Memo, February 19, 1976 from Fitz to Chance.

[Exhibit No. 97 was filed.]

Mr. PEDERSEN. A memo, file memorandum, February 6, 1976, Charles J. Chance.

[Exhibit No. 98 was filed.]

Mr. PEDERSEN. Letter, February 3, 1976, to Ripley from Fish and Wildlife.

[Exhibit No. 99 was filed.]

Mr. PEDERSEN. Letter of February 22, 1976, to Ripley from Greenwalt.

[Exhibit No. 100 was filed.]

Mr. PEDERSEN. Letter, March 9, Ripley to Skoog.

[Exhibit No. 101 was filed.]

Mr. PEDERSEN. Letter, March 12, 1976, Ripley to Black in Atlanta.

[Exhibit No. 102 was filed.]

Mr. PEDERSEN. Letter, March 18, 1976, Benson to Ripley.

[Exhibit No. 103 was filed.]

Mr. PEDERSEN. Letter, March 26, 1976, Fitz to Boles, Fish and Wildlife.

[Exhibit No. 104 was filed.]

Mr. PEDERSEN. Letter dated March 31, 1976, [1-250] Benson to Ripley.

[Exhibit No. 105 was filed.]

Mr. PEDERSEN. Letter, April 9, 1976, Ripley to Starnes.

[Exhibit No. 106 was filed.]

Mr. PEDERSEN. Letter of April 13, 1976, Ripley to Henry.

[Exhibit No. 107 was filed.]

Mr. PEDERSEN. Telegram, April 21, to Kenneth Black from Ripley.

[Exhibit No. 108 was filed.]

Mr. PEDERSEN. File memorandum, Richard Fitz, dated April 1, 1976.

[Exhibit No. 109 was filed.]

The COURT. Now, Gentlemen, the Court addresses this remark to counsel for both sides. On the last page of the pretrial order it states:

> Parties shall exchange names and addresses of their witnesses in writing on or before April 19, 1976, and mark exhibits two days prior to trial.

Now, the way we are handling the exhibits in this case, one of the main purposes of the pretrial hearing is defeated.

These exhibits should all have been marked and the only thing that you would have had to have [1-251] done was say, "We offer Exhibits 1 through 20," or whatever it is.

Now instead of that the Court has been sitting here waiting on counsel, each side counting unreasonably these exhibits.

I make those observations not for this case but for the next case. I don't want this to occur in any case in the future because it is just intolerable for the Court to have to sit here and wait

on counsel while they are counting. Neither side has apparently complied with the pretrial order.

Mr. PEDERSEN. Your Honor. I think it pleases me more to hear what the Court says. I wanted to do exactly that thing when I brought them down to the court reporter the other day, to get them stamped.

I would love to have had them all numbered right there, but it isn't the practice here, apparently. They leave a blank so that the number can be put on when it is introduced.

Now it is just a question of mechanics and, frankly, I think I am not the only one that has been somewhat confused as to what the pleasure of the Court is.

[A discussion was had concerning future marking of exhibits.]

[1–252] Mr. DOUGHERTY. There was one exhibit that was introduced, which was a telegram. I have no objection to them introducing the document. I would object to the truth of that.

The COURT. All right.

Mr. DOUGHERTY. That is set forth in that document and would want to cross-examine that witness that supposedly——

The COURT. Your objection will be noted.

RICHARD B. FITZ, called as a witness by and on behalf of the defendant, after having been first duly sworn, was examined and testified as follows:

Mr. PEDERSEN. The next witness for the TVA is Richard B. Fitz, thirty-six years old, a resident of Oak Ridge, Tennessee. He is a fisheries biologist for TVA, for the past thirteen years.

He is a graduate of Colorado State University with a bachelor of science degree in fisheries science.

He has completed 75 to 80 percent of course work required for a master's degree in water resource management.

He is a certified fisheries scientist by the American Fisheries Society. He has authored various [1–253] papers in the scientific journals.

DIRECT EXAMINATION

By Mr. PEDERSEN:

Q. Mr. Fitz, will you describe your duties with the TVA?

A. My duties at the present time are devoted full time to the supervision and conduct of the TVA snail darter conservation program.

Prior to this time I have done work with fish distribution, fish population analysis.

Q. When did you first become involved in the snail darter problem?

A. In October of 1974 was the first time I saw a specimen of a snail darter.

Q. Did you collect it yourself or what happened then?

A. This was part of a general fish sample in the Little Tennessee River. We weren't specifically involved with the snail darter on that particular time but I did, as a matter of fact, pick one up during this sampling.

Q. And that was the first time you encountered it?

A. Yes.

Q. Had any encounter with the fish at all?

A. Yes.

Q. You were involved in the preparation of the [1–254] TVA program to conserve the snail darter?

A. Yes, I was.

Q. And then did you put the team together to conduct the searches?

A. Yes. The responsibility was given to me to select the team members.

Q. Without a lot of detail, just say in sort of a layman's term what you did and where you went for what purpose.

A. Well, of course, the idea was to see if there were other populations of the snail darter existing elsewhere. And we started our efforts looking at rivers which had conditions that were similar to what we had observed in the Coytee Springs area, and as time went on, why, we deviated from this more and more.

Q. Then you were immediately in charge of this team of divers. How many men did you have working for you on this program?

A. I have a total of twelve people full time right now, six of whom are certified scuba divers and have been doing most of the diving and searching for this fish.

Q. Are these fisheries scientists or biologists, or what are they?

A. I have two people on the crew who are classified as biologists and the rest are technicians.

[1–255] Q. Do you recall when you first began to make any transplants of them?

A. Well, the first transplants were in June of 1975.

Q. And where were they transplanted?

A. These were transplanted to the Hiwassee River.

Q. Why did you select the Hiwassee?

A. Well, it was based on a number of things. Dr. Etnier and Wayne Starnes in their research proposal had mentioned the Hiwassee River, and from our past experience in the Hiwassee River on unrelated projects we knew that it was indeed similar in many respects to the Little Tennessee River. And then finally we checked the historical records on water quality, temperature, and so forth, and this again verified that the conditions were very similar in the Hiwassee River.

Q. In addition to this suggestion from Dr. Etnier where you might look for them to transplant them, did Dr. Raney assist you in any way of suggesting any places you might look for snail darters?

A. Yes. Dr. Raney made several suggestions to us.

Q. Were the suggestions good or bad or did you look where he told you to look?

Mr. DOUGHERTY. Your Honor, I don't think it [1–256] would be appropriate to ask him whether it was good or bad.

Q. Well, were they fruitful?

The COURT. Yes. You don't want to ask any question that will reflect on any other witness. I don't know, I am not saying that would reflect on him.

Q. Did you follow Dr. Raney's suggestion?

A. Yes, we did.

Q. Did you find any where he suggested you might?

A. Yes, we did.

Q. Give us some examples of that.

A. Well, in the area of Watts Bar Reservoir, just perhaps a thousand feet downstream from the former mouth of the Little Tennessee River, was the first place we located them.

Then four miles downstream from this same point we located a single specimen, and then again ten miles downstream in Watts Bar Reservoir three specimens, as I recall, three or four specimens have been sighted.

Q. Have you done some of this scuba diving yourself; have you looked for them yourself?

A. I have not been in on the actual scuba diving part, no.

Q. When they make their dives and exploration [1–257] at various sites designated by you, do they report to you?

A. Yes, sir.

Q. Exactly what they find?

A. Yes, sir.

Q. And then this is part of what is reported to the Fish and Wildlife in your reports to them of these discoveries?

A. Yes.

Q. Do you know whether these fish are di[illegible]lt or easy to detect, or what do you find with your divers [illegible]ocating them?

Mr. DOUGHERTY. Your Honor, I would ob[illegible]

I don't think this witness has personal kn[illegible]ge of it in that he has already testified he is not a diver. I t[illegible] it would be up to them to testify about it. He is really testifying what somebody else told him.

The COURT. Well, that wouldn't be competent but your objection goes to the weight of the testimony.

As I understand, these divers are under his supervision. Now, of course, I cannot receive what they told him but I can receive what he did as a result of what they told him.

Mr. PEDERSEN. Right.

[1–258] By Mr. PEDERSEN:

Q. Tell us about the difficulties, if any, that——

Mr. DOUGHERTY. Your Honor, I object to this, this is the same question in connection with what someone else——

The COURT. The objection is overruled. Now the Court has ruled and don't interfere anymore, on this point.

A. Well, the observation of these fish depends quite a bit on of course the clarity of the water, and quite often, most of the time in fact, in the deeper water areas this visibility is very poor and they are very hard to find. Their coloration pattern camouflages them and under the best of conditions quite often they are overlooked.

Q. Do you have an opinion, Mr. Fitz, as to whether the snail darter would survive impoundment of the Tellico Dam?

Mr. DOUGHERTY. I must object, Your Honor. I don't think he has been qualified as an expert ichthyologist nor has he been qualified with regard to expressing an opinion about it.

The COURT. That objection goes to his weight. I understand that, and the objection is overruled with that explanation. It goes to the weight of his testimony.

[1-259] Q. Do you have such an opinion?

A. My opinion is based on these finds of the fish in Watts Bar Reservoir and Chickamauga Reservoir, that perhaps it will survive.

Q. Do you have an opinion as to whether or not the transplant will be successful?

Mr. DOUGHERTY. Same objection for the record.

The COURT. Same ruling.

A. The evidence we have gathered thus far indicates that the transplant will be successful.

Q. That it will be successful.

A. Yes.

Mr. PEDERSEN. If Your Honor please, Mr. Fitz was deposed at length on March 31, 1976, and his deposition contains a great collection of detailed facts and we will just conclude the direct examination by filing that as a part of his testimony for the record in this case.

By Mr. PEDERSEN:

Q. You have stated that you were an ichthyologist; is that correct? Are you an ichthyologist?

A. Well, I am not really sure what the exact definition of an ichthyologist is. I am classified as a fisheries biologist.

Q. Fisheries biologist?

[1-260] A. Yes.

Q. Do you have an opinion as to whether or not the darter can survive and reproduce in reservoirs?

Mr. DOUGHERTY. Same objection, Your Honor.

The COURT. Same ruling. Your objection goes to the weight of his answer rather than the competency.

A. Based on our findings in the Watts Bar and Chickamauga I would have to say they would.

Q. They would reproduce and survive?

A. Yes.

Mr. PEDERSEN. That is all.

CROSS-EXAMINATION

By Mr. DOUGHERTY:

Q. First of all, Mr. Fitz, you hold a bachelor's degree from what college or university?

A. Colorado State University.

Q. And that's the only degree you have. You do not have any master's degree or Ph. D. degree; is that correct?

A. That is correct.

Q. And you do not have a bachelor's degree in ichthyology per se, do you?

A. It is a bachelor's degree in fisheries science.

[1-261] Q. And you have done no scuba diving yourself?

A. No, sir.

Q. You are relying on what someone else tells you?

A. For the most part, yes.

The COURT. Now, that is not competent, if you are relying, if your testimony is based on what somebody told you, that would not be competent for any purpose.

Now I got the impression that these people worked under you and you worked with them and you gave your opinion from the knowledge you acquired while working with them.

If I am wrong about that tell me.

The WITNESS. You are right.

Mr. DOUGHERTY. He is relying on what the people have done, who have done the diving have told him, Your Honor, and not what he has——

The COURT. I hold that that is competent and your objection goes to the weight rather than the competency.

By Mr. DOUGHERTY:

Q. Now I believe you respect Dr. Etnier as an ichthyologist, do you not?

A. Yes.

[1-262] Q. You feel like he is an extremely competent individual?

A. Yes.

Q. And you would agree in the same connection with Mr. Wayne Starnes?

A. Yes.

Q. And that those two people probably know as much about the snail darter as anyone else?

A. I would think they do, yes.

Q. If not more.

A. They know more than most people, yes.

Q. And would you not agree, for example, that Wayne Starnes has conducted an intensive and in depth study of the life history of the snail darter which no one else has really done?

A. I don't know whether I would agree to that or not.

Q. Has anyone studied it to the extent in terms of laboratory perspective to the extent that Wayne Starnes has?

A. Well, I feel like our investigation has probably been as extensive.

Q. In that connection, Mr. Fitz, what is your opinion based upon in connection with your comment that the snail darter will survive in impoundment?

[1–263] A. My opinion is based upon the fact that we have found them in reservoirs.

Q. And is that the sole basis for that opinion?

A. Well, there are some details of the reservoir conditions that back that up.

Q. I am asking you though, is that the sole basis for that opinion, the findings, for example, of certain specimens in places other than the Little Tennessee River?

A. That's, yes, at the moment it is.

Q. And we get to those finds, first of all the only place you have them outside the Little Tennessee River other than the transplant area in the Hiwassee River, is three specimens in the area of one thousand or fifteen hundred below the confluence of the Little Tennessee and the Watts Bar Reservoir; correct?

A. Yes.

Q. One specimen four miles downstream from that point.

A. Yes.

Q. Four specimens in the area of ten miles downstream in the area of the city of Loudon?

A. Yes.

Q. Do you have any evidence other than the observation of these specimens at these locations that there has been any successful reproduction in those areas?

[1–264] A. No direct evidence.

Q. And would you not agree that before you could consider an area as a habitat for a particular species that there would have to be some definitive evidence that successful reproduction could be carried on in that location?

A. No.

Q. And you are telling us that—I am talking about in terms of critical habitat.

A. Yes, at some place within that habitat it would be critical.

Q. And you would agree, would you not, that an essential element of a critical habitat is the successful reproduction in that area?

A. Well, an essential part of critical habitat is an area to reproduce in; yes.

Q. And in that connection the only specimens outside of Watts Bar that you have actually collected were the two specimens, one four miles downstream and one in the area of one thousand or fifteen hundred feet below the confluence?

A. Yes, those are the two we have collected.

Q. And those two were the two that were turned over to Wayne Starnes which he dissected?

A. Yes.

Q. And is it not a fact that those two specimens [1–265] were nutritionally deficient?

A. I don't have that opinion, no.

Q. Did you dissect them and examine them yourself?

A. No. I did examine them; I didn't dissect them.

Q. All you did was make a gross visual observation?

A. Yes.

Q. You would agree, would you not, that the creation of the Tellico Reservoir and the closure of the dam will alter and modify the snail darter's habitat, for example, at Coytee Springs, river mile 7?

A. Yes, it will alter it.

Q. And would you not further agree that the effect of the impoundment will alter and modify that habitat adversely to the extent that it will at least diminish the number of population in that area?

A. I don't have any evidence right now that would lead me to believe that.

Q. You don't have any evidence to the contrary either, do you?

A. That's correct.

Q. In fact, really is it not a fair statement, Mr. Fitz, that the opinions you have expressed are not really supported by scientific data?

[1–266] A. Which opinion?

Q. I am talking about the opinion that the snail darter can survive in impoundment.

A. Well, it's supported by the fact that we have found them in an impoundment.

Q. And as to how they got into that impoundment area and whether there is a significant or successful population of those

areas or whether there is a successful reproduction in those areas, you have no evidence or scientific data to support that at all?

A. We have no evidence to support that there will be reproduction.

Q. All right.

Now is it not also a fact that at this point in time you have no definitive evidence that there has been any successful reproduction of the snail darter in the transplant area in the Hiwassee River?

A. We have no evidence other than finding adults that appear to have spent their reproductive products.

Q. And all we are saying there is that you have a female who has deposited eggs, correct?

A. Yes, and we have males who appear to be spent too.

Q. But you have no evidence whatsoever that there has been any proper fertilization of those eggs nor [1–267] have any of those eggs hatched to produce young snail darters?

A. That's correct.

Q. And would not that be a necessary prerequisite before you could determine that there had been any successful, truly successful reproduction in an area?

A. Yes.

Q. So at this point in time you cannot testify from a point of view of scientific data and information that the transplant in the Hiwassee River is actually successful?

A. Not from a reproductive standpoint.

Q. And would you not agree that reproduction is absolutely essential in terms of an effective transplant over a period of time?

A. Yes.

Q. Now as to how these snail darter specimens got into the area in the Watts Bar Reservoir, you obviously have no firm evidence as to how this occurred?

A. No.

Q. And as to how long those eight specimens that you have observed in Watts Bar have been there, you also have no information or no scientific data in that regard; correct?

A. That's correct.

Q. Now when these divers, well, first of all, [1–268] the snail darter exists and swims and lives and eats and grows basically on the bottom of these river areas?

A. Yes.

Q. And would you not agree that the most typical habitat of the snail darter as you have observed it is the area similar to Coytee Springs at river mile 7 in the Little Tennessee River where you have a sandy gravel substrate which is smooth and a degree of current?

A. What do you mean by most typical?

Q. Is that not a fact where you have found and observed the majority of the population of the snail darter?

A. Yes.

Q. And would you not agree that the Little Tennessee River, at the very least, is demonstrating the significant portion or major portion of the range of the snail darter as you all know it?

A. When you speak of range are you speaking of mileage?

Q. No, I am talking about in terms of population and density.

A. Yes.

Q. And would you not agree that at the very least the population as has been estimated by Mr. Starnes of the snail darter in the Little Tennessee River is in the area of ten thousand and probably considerably in excess of [1–269] that?

A. I don't have any information to make an estimate, but that is reasonable.

Q. When I took your deposition and asked you that question some time ago didn't you essentially agree with that, and also further say that you thought it was probably more than ten thousand?

A. As I recall I did.

Q. In the Little Tennessee River. And the only specimens you have found outside of the Little Tennessee other than the transplant area have been eight?

A. No. Ten.

Q. We will get to Chicakamauga in a minute. I am talking about in **Watts Bar**.

A. Okay, it's eight.

Q. And the individuals who supposedly observed two snail darter specimens in an area outside the Watts Bar Reservoir below Watts Bar Dam in the Chickamauga Reservoir was an individual who graduated from UT last June and went to work for TVA in August and began work on the snail darter program in October 1975, David Turner?

A. Yes .

Q. And you would agree that he does not have any MA or MS degree or Ph. D. degree in ichthyology?

A. That's correct.

[1-270] Q. And you would also agree from what you have been advised that a diver down on the bottom of these water areas, in let's say ten, twelve or fifteen feet, it's awfully dark down there, to distinguish one form of darter from another at a distance of several feet in somewhat dark areas, is very difficult?

A. Given those conditions, yes, it would be difficult.

Q. And particularly when the individual never actually handled or looked at the fish closely but as soon as he looks at it the fish swims off?

A. If those are the circumstances it would be difficult.

Q. And in fact, this individual observed the fish in Chickamauga Reservor for such a short period of time, when he first saw it he jerked the rope which was connected to his buddy and by the time his buddy looked it was——

The COURT. Let's not go into all of that, Mr. Dougherty. You are going into things not in the record. Let's cut out all of those details, please.

Mr. DOUGHERTY. Yes, sir.

By Mr. DOUGHERTY.

Q. In connection with the transplants, Mr. Fitz, TVA did not at any time apply for a permit in connection with [1-271] the transplant prior to June of 1976, did it?

A. No, not for the ones transplanted in June.

Q. And, in fact, you had already done some of the transplanting in June of 1975?

A. Yes.

Mr. DOUGHERTY. That is all.

The COURT. That's all.

By Mr. DOUGHERTY.

Q. I am sorry, I meant January of 1976. You understood what I meant?

A. I don't now, no.

Q. In connection with the transplant program, the first time TVA ever applied for an interim permit to approve the transplant program, was in January 1976?

A. No.

Q. When were they given a permit prior to January 1976?

A. You said applied.

Q. Talking about issued a permit.

A. I don't remember the exact date but I think that's close, yes.

Q. Close to January 1976, and you had been engaging in transplants since June of 1975.

A. Right.

Mr. DOUGHERTY. Okay.

[1-272] The COURT. That is all.

Mr. PEDERSEN. Just one question.

The COURT. We have heard enough of him, Mr. Pedersen.

Mr. WAGNER. I think it is important to note that the fish was not listed until November, 1975 and we don't have to have a permit until then.

The COURT. We accept that, what you say about it.

[Witness excused.]

The COURT. Call your next witness.

CHARLES F. SAYLOR, called as a witness by and on behalf of the defendant, after having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

By Mr. WAGNER:

Q. You are Charles F. Saylor?

A. Yes, sir.

Mr. WAGNER. If the Court please, I will just make a brief statement.

The COURT. That's the way to do it.

Mr. WAGNER. Age twenty-six, living in Knoxville, Tennessee, has a BS in zoology from the [1-273] University of Tennessee in 1972. He transferred from pre-med. He became interested in aquatic biology and he had courses in aquatic biology, ichthyology, fisheries biology and aquatic invertebrates while you were studying at the University of Tennessee.

You also studied darters both by way of classroom and by way of field study under Dr. Etnier while at the University of Tennessee.

You have been employed by the TVA since August of 1972 working as an aquatic biologist.

By Mr. WAGNER:

Q. Is that correct?

A. Yes, sir, all except for that aquatic invertebrates. That was invertebrate zoology.

Q. Invertebrate zoology?

A. Yes, sir.

Q. Okay. And you have been working for TVA since 1972 in aquatic biology?

A. Yes, sir.

Q. When did you first become involved in the snail darter conservation program?

A. In the middle of the summer of 1975. The exact date I am not certain.

Q. When did you first become aware of the [1–274] existence of the snail darter or when did you first see a snail darter?

A. In the fall of 1974.

Q. Between the fall of 1974 and the summer of 1975 did you do any work on the snail darter or snail darter program?

A. A little bit.

Q. What type work did you do?

A. In the fall we seined the Coytee Springs area and also took fish samples down the river in search of fish.

Q. Okay. Since the summer of 1975 have you been involved full time in the snail darter conservation program?

A. Yes, sir.

Q. And what have your activities consisted of?

A. In the summer of 1975, that was the first transplant. We transplanted 410 snail darters. I was involved in that. Most of those were transplanted to the Hiwassee River. 61 were planted in the Nolichucky.

Q. Let's stop here just a minute. In connection with the transplant program you say it began in June of 1975?

A. Yes, sir.

Q. Now were you in charge of the actual transplantation of these fish?

A. The first 49 Dick Fitz accompanied most of that work. Afterwards I was in charge of the field [1–275] operation.

Q. Now there were 410 transplanted to the Hiwassee.

A. No. It would be less than that because of the 61 that went to the Nolichucky.

Q. Okay. 410 less 61. Now let's cut off this Nolichucky transplant right at the outset.

Have we continued to pursue the Nolichucky transplant?

A. No, sir.

Q. Why not?

A. We discovered a rare darter there, the sharkhead darter, that was once believed to be extinct, and there is a rare snail there, too.

Q. Now when you discovered the other darter that was once thought to be extinct you abandoned that transplant?

A. Yes, sir.

Q. Now then with regard to the Hiwassee site, how many different sites do you have there?

A .Three.

Q. How did you arrive at those sites on the Hiwassee River?

A. We surveyed the river and the substrate looked similar to the Little Tennessee.

[1–276] First, we have examined other rivers and the Hiwassee came, appeared most suitable for a transplant.

Q. Was it recommended to you by anyone?

A. Dr. Ecnier suggested it.

Q. What about Wayne Starnes?

The COURT. One is enough. Leave Wayne out of it.

Mr. WAGNER. Okay.

By Mr. WAGNER:

Q. In your opinion do you consider the Hiwassee River suitable for a transplant?

A. Yes, sir.

Q. Okay. And they were transplanted three different locations over a period of how many days or weeks?

A. Oh, I will guess approximately maybe four to six weeks.

Q. All right. Were there any special precautions taken in connection with the transplant?

A. Yes, sir. We transported the fish in a cooler so as to maintain a cool temperature, and we took along an air pump in case the DO started getting low and the fish began to work. We wanted to keep them out of stress.

And when we arrived at the Hiwassee we acclimated the fish to the temperature of the water in the [1–277] Hiwassee River,

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and after releasing them we observed to make sure they were in a satisfactory condition.

Q. Were there any casualties in connection with the transplant?

A. No, sir.

Q. Have there been any subsequent transplants since this initial June transplant in 1975?

A. Yes, sir.

Q. When were those transplants?

A. I believe it was this winter—no, it was the fall of 1975.

Q. In the fall of 1975?

A. Yes.

Q. Okay. And who was in charge of that transplant operation?

A. Gary Hickman was more involved there than I.

Q. Following these transplants have you or other members of TVA diving crew been back to observe the snail darters in the transplant locations?

A. Yes.

Q. And approximately how many times have you been back?

A. Oh, that is hard to say exactly. Maybe twenty or thirty times.

Q. Have you compared the sexual progression of [1–278] the fish and the condition of the fish at the three transplant sites on the Hiwassee versus the condition of the fish in the Little Tennessee River?

A. Yes, sir.

Q. And how have they compared?

A. They were parallel.

Q. They were or they are?

A. They are.

Q. And could you describe to me what you mean by their progression is parallel?

A. Yes, sir. In November the milt began to flow.

Q. What do you mean by that?

A. Well, you can press their stomachs lightly and the sperm will begin to flow from the sex organs around the anal opening, and later on in December they began to develop tubercles, around the last of November when the water starts cooling up.

Q. These are the males?

A. These are the males, yes, sir.

Q. Okay.

A. Later on, in February of the next year, 1976, early spring, the females began to flow eggs, and this occurred both in the Little T and Hiwassee, and the males began to be more fully developed with color and tubercles.

[1–279] Q. Okay. Has what you described been present in both the Little Tennessee River as well as the Hiwassee River?

A. Yes, sir.

Q. Okay. And as late as last week were the transplant sites, as this past Saturday, were the transplant sites surveyed?

A. Yes, sir.

Q. And were substantial numbers of snail darters seen at the transplant site?

A. Yes.

Q. Okay. And based on the information that you have to date and based on all the information currently available, in four opinion do you feel like there has been a successful transplant to the Hiwassee River?

Mr. DOUGHERTY. Your Honor, I would object. I don't think the proper predicate has been laid with regard to this witness. I additionally object because I don't think he has been qualified as an expert ichthyologist.

The COURT. Overruled.

By Mr. WAGNER:

Q. Go ahead and answer.

A. Today it appears that there is successful transplant.

Q. Let me ask you a litle bit, talk about your [1–280] expertise for answering questions with regard to the snail darter. Approximately how many snail darters have you seen?

A. Roughly guessing around two thousand.

Q. Is that both in and out of the Little Tennessee River?

A. Yes, sir.

Q. You feel like you have seen about as many snail darters as anybody in the world?

A. Yes, sir.

Q. Have you worked full time on the snail darter program since June of 1975?

A. Yes, sir.

Q. And do you feel that you are an expert on the snail darter?

Mr. DOUGHERTY. Your Honor, I object. I think that is for the Court to determine and not for this witness to say.

The COURT. I think you are right about that but I'm going to let him give his opinion, his own knowledge. It may be right, may be wrong. I don't know. I will take it for whatever it is worth.

Mr. WAGNER. Thank you, Your Honor.

A. Well——

The COURT. Like a fellow who owns a horse and it is run over by a railroad train, he doesn't [1–281] know a thing about horses but he can give the value of the horse, and I am going to let this boy give the value of his knowledge.

Mr. WAGNER. Thank you, Your Honor.

A. As far as being familiar with the fish and its habitat and general things about the fish, I feel like I am probably as knowledgeable as other people that have worked in the field with it any other persons that have worked in the field.

As far as doing counts and measurements and things of this nature, I feel like I may be, you know, less than Etnier and Wayne Starnes.

By Mr. WAGNER:

Q. Thank you.

Now with regard to your searches of rivers outside the Little Tennessee and separate and apart from the transplant sites, have you and other members of the TVA diving crew observed snail darters outside the Little Tennessee River?

A. Yes, sir.

Q. Have you also observed snail darters immediately below the Watts Bar Dam in that three-tenths of a mile section prior to the mouth of the old Little Tennessee River?

A. You mean Tellico Dam, Fort Loudoun Dam, the one you are referring to.

[1–282] Q. Correct, excuse me. I am taking about the three-tenths of a mile stretch between the Tellico Dam and the old mouth of the Little Tennessee River. Have you searched in that area?

A. Yes, sir.

Q. And is that a part of the Watts Bar Reservoir?

A. Yes, sir.

Q. All right. Its backed up there, the water is backed up there as part of the Watts Bar Reservoir?

A. Yes, sir.

Q. Approximately how many snail darters have been observed in that area?

A. Approximately a hundred or so, well, over a hundred; a little over a hundred.

Q. With respect to the number of dives and number of time spent there looking for snail darters, have as many snail darters been discovered there and seen there per hour of diving time as have been seen at Coytee Springs?

Mr. DOUGHERTY. Your Honor, I would object as leading. I think he is leading in this particular instance.

The COURT. Well, it is a little leading. It is late in the evening, we will let him lead a little since it's so late in the evening. In the morning we will cut him off.

[1–283] Mr. WAGNER. Thank you, Your Honor.

By Mr. WAGNER:

Q. Go ahead.

A. There is a larger concentration of fish per area there than there is in the localities in the Little T.

Q. Have fish been observed of all ages in that area?

A. Yes, sir.

Q. I mean, when I say of all ages, between from infants right on up to the adults?

A. Well, young of the year, you know. They were almost two years.

Q. What's the depth of the water at that point?

A. Well, according to the stage of the reservoir it varies from, where we saw the darters, from thirty feet maybe to twenty-five feet, something of that.

Q. Were photographs taken of the darters in that area?

Mr. DOUGHERTY. Your Honor, could we clarify this because I think in reality we are talking about, this is still part of the Little Tennessee River and not Watts Bar Reservoir, and I think possibly the matter has been misconstrued and I don't want the record to appear confused in that regard.

The area he is talking about is actually still [1–284] part of the Little Tennessee River and has been designated by even Mr. Saylor and some of these other folks as river mile .2 and .3

of the Little Tennessee River and it is not the Watts Bar Reservoir.

The COURT. It is not a reservoir?

Mr. DAUGHERTY. No, actually part of the Little Tennessee River.

Mr. WAGNER. No, Your Honor, that is not an accurate statement at all. It is a part, it is in the old riverbed of the Little Tennessee River.

The COURT. I can't decide between you lawyers. I have too much respect for each of you.

Now is it a reservoir you are talking about or is it a river?

The WITNESS. It is both. It contributes to the river mileage but it also is covered by the backwaters of the lake.

The COURT. Is it still water where you found these?

The WITNESS. No, sir, there is current there. There is current, there is flow.

The COURT. It is not still then?

The WITNESS. No.

The COURT. It's not a reservoir then?

The WITNESS. Well, you may have to go to a [1-285] dictionary for that actual question.

Mr. WAGNER. Let me see if I can clear this.

By Mr. WAGNER:

Q. Do the backwaters of the Watts Bar Reservoir come back that far?

A. Yes, sir.

Q. As a result of the Watts Bar Reservoir is water backed up in that area?

A. Yes, sir.

Q. And is the water higher there than it was before the Watts Bar Reservoir was impounded?

Mr. DOUGHERTY. Your Honor, I don't want to make an issue but I object to this line of questioning until we can deal with it properly.

The COURT. I will let him continue. Go ahead.

Q. At any rate, in that area snail darters have been observed at between twenty-five and thirty feet of water?

A. Yes, sir.

Q. And were photographs taken of both the area and the snail darters discovered there?

A. Yes.

Q. I hand you those photographs and ask you if you can go through this quickly——

[1-286] Mr. DOUGHERTY. We agree to stipulate.

Mr. WAGNER. I would like for the Court to be able to see them too.

The COURT. File them.

Mr. WAGNER. They have been marked.

[Referring to Exhibits 51 through 59.]

By Mr. WAGNER:

Q. Have snail darters also been found in other areas of the Watts Bar Reservoir?

A. Yes.

Q. Just tell me where they have been found.

A. At Browder Island, approximately four miles below the mouth of the Little T.

Q. Now how many were found there and by whom?

A. One was found by us.

Q. And one was found by whom else?

A. Starnes located one there, I believe, or several. I am not exactly sure.

I left out that we also found two out from the mouth, one immediately out from the mouth of the Little Tennessee in the main stream and one further downstream from the Little Tennessee in the main stream.

Q. Where else?

A. At approximately ten miles below the Little T near Loudon.

[1-287] Q. How many were found there?

A. Four.

Q. Charles, how difficult is it to see snail darters or to find snail darters, I think would be the better question?

A. Its more difficult there because your vision is reduced by the depth and the silt.

Q. Is it difficult to find snail darters anywhere?

A. At times it's also difficult to find them in the Little T.

Q. What about at Coytee Springs, is it difficult to find them there from time to time?

A. Yes, sir.

Q. And it's even more difficult in the Big River?

A. Yes, sir.

Q. And the fact that four snail darters were found at ten miles below the mouth, does that mean that there are just four there?

A. No.

Mr. DOUGHERTY. Your Honor, I would object. I don't think the proper predicate has been laid for that.

The COURT. Maybe not but we will let him answer.

[1-288] By Mr. WAGNER:

Q. Go ahead.

A. That indicates that there is a significant number there. Where, you know, chances of just spotting four fish that were there is really a long shot.

Q. All right. Do you have an opinion as to whether or not the snail darter can live and reproduce in the Watts Bar Reservoir and Chickamauga Reservoir?

A. Well, it's just an opinion right now but yes, I am of that opinion.

Q. Okay.

Now with regard to the area above the 411 bridge after impoundment, have you examined the substrate of the area itself?

A. Yes, sir.

Q. And how does that substrate compare with the substrate around Coytee Springs?

A. It is sandy gravel there.

Q. Now following impoundment would there be a substantial flow there below the dam?

A. Yes, sir.

Q. Will there be silt deposited on the bottom of the river?

A. It shouldn't be.

Q. And why not?

[1-289] A. Because the current from the tailwaters flow through——

Mr. DOUGHERTY. Your Honor, I must object. I don't think the question has a proper predicate in it nor does it contain sufficient information or any indication that this witness knows what the impounded area is going to be like above 411 bridge, between there and Chilhowee Dam.

The COURT. All of those are matters for cross-examination. Your objection is overruled. It goes to the weight rather than the competency.

By Mr. WAGNER:

Q. Go ahead.

A. Well, the current of the river is along the bottom, the silt will be flushed out. You know, there isn't any silt to settle there.

Q. Okay. And are there areas up above 411 bridge for about ten miles just below the dam that will be less than thirty feet deep?

A. Yes, sir.

Q. And you feel that would be a suitable place for transplantation after impoundment?

Mr. DOUGHERTY. Same objection, Your Honor.

The COURT. Same ruling.

Do you have an opinion on that? Do you have [1-290] an opinion on the question that he asked you?

The WITNESS. As to whether there will be a suitable place for transplant?

Mr. WAGNER. Right.

The COURT. First, do you have an opinion about it?

The WITNESS. I had rather not establish an opinion at this time.

The COURT. All right, if you don't we will go to something else. All right.

He doesn't have an opinion, he doesn't want to establish it. We've got to be careful about this establishing.

Mr. WAGNER. I believe that is all, Your Honor.

The COURT. Now it is 5 o'clock. We are going to have a recess now, gentlemen.

How many more witnesses do you have?

Mr. WAGNER. We have, I think maybe three more witnesses.

The COURT. Well, now, who are they. Let's see if we can't cut some of this down.

Mr. WAGNER. Your Honor, we have Gary Hickman.

The COURT. Stipuate on some of——

Mr. WAGNER. Gary Hickman will testify [1-291] substantially the same thing as Charles Saylor testified to.

The COURT. Now, will you stipulate that he will testify substantially to the same thing this gentleman has testified to, Mr. Dougherty?

Mr. DOUGHERTY. I would stipulate that he would say that but I would not stipulate the truth of it.

The COURT. I don't want you to stipulate the truth, that's right, but he will testify. You will stipulate that he will testify to the same thing this gentleman testified to?

Mr. DOUGHERTY. Yes, Your Honor.

The COURT. All right. Now that ought to be sufficient.

Mr. WAGNER. I would like to establish his qualifications.

The COURT. Well, I will let you establish them by you telling the Court what they are. I will accept what you say about it.

Mr. WAGNER. I will do that.

The COURT. Yes, all right.

Mr. WAGNER. Do you want me to do it now or do you want me to wait until in the morning?

The COURT. Better do it now.

[1–292] Mr. DOUGHERTY. First, I would like to cross-examine would be the limit of his qualifications.

The COURT. Yes.

Mr. WAGNER. Your Honor, Gary David Hickman lives in Clinton, Tennessee. He has a bachelor of science degree and a master of science degree in zoology from the University of Arkansas with special emphasis in fisheries. His master of science came in 1972.

Prior to coming with TVA he was a regional fisheries management and biologist for the Missouri Department of Conservation from 1972 to 1974.

He came with TVA in 1974. Prior to coming with TVA he studied several species of darters in connection with the preimpoundment study of the Mulberry River in Arkansas. There he classified sixty different—didn't classify but identified sixty different species, about fifteen of which were darters.

In his period of time with TVA he has been with the conservation program since the summer of 1975. He has observed in the neighborhood of two thousand snail darters.

Mr. DOUGHERTY. Your Honor, I thought we were just going to mention his qualifications, not get [1–293] into his testimony.

Mr. WAGNER. I think this is a part of his qualifications to be able to speak the same opinion as Mr. Saylor does.

Mr. DOUGHERTY. I think we agreed to stipulate that he would say essentially the same thing.

The COURT. Will you stipulate that he will testify that he has handled approximately two thousand?

Mr. DOUGHERTY. Yes, sir. I will stipulate to that. I think that would be the limit of his qualifications.

The COURT. All right. Now it is stipulated. What's his name?

Mr. WAGNER. Gary David Hickman.

The COURT. That Gary David Hickman will testify substantially the same thing as Mr. Saylor.

Mr. WAGNER. Right. Could we also offer his deposition as just a part of the record in the case?

The COURT. Yes.

Now you have two more after this gentleman completes his testimony; is that right?

Mr. WAGNER. Yes, Your Honor. I believe though we also have Dr. Edward Raney from Cornell University, and he will have to testify.

The COURT. Now is that one of the two? [1–294] That's a cattle school. That's not a fish school. We had the whole crowd down here testifying to these cattle over here at the Aluminum Company and I don't want them to get mixed up with fish, mixed up with the cattle.

Mr. PEDERSEN. We hope he doesn't either, Your Honor.

The COURT. You will have to lecture him on that.

[Laughter in the courtroom.]

Mr. WAGNER. It wouldn't compare with Yale, we recognize that, but it's good second best there.

In addition to that we have David Turner, who Mr. Dougherty was trying to cross-examine all the witnesses about his finding in the Chickamauga Reservoir. I think his testimony would be highly critical and we ask to put him on.

The COURT. You told me in the beginning you had three witnesses.

Mr. WAGNER. Those are the other two.

The COURT. One of them we have stipulated.

Mr. WAGNER. Those are the other two.

The COURT. And you have two left, is that right?

Mr. WAGNER. Yes.

[1–295] The COURT. Who are they?

Mr. WAGNER. Raney and Turner.

The COURT. Well, what about your Cornell man?

Mr. WAGNER. That is Raney.

Mr. PEDERSEN. That is Dr. Raney, Your Honor.

The COURT. Well, we want to look in his eye when he comes.

Mr. DOUGHERTY. I think we should, Your Honor.

The COURT. Off the record——

[Remarks of the Court off the record.]

Mr. DOUGHERTY. Could I make one statement for the record, Your Honor.

Just for the record, the plaintiffs' position is that the evidence that TVA has attempted to introduce with respect to good faith or lack of being arbitrary or capricious in connection with the matter, really is not a pertinent issue and it is really irrelevant to the issues we are dealing with, and we would raise an objection for the record in that connection.

The COURT. Well, I will make the same ruling I have been making but I am not saying by that that you are wrong. I think these issues are limited very much, very much, but after the testimony is finished [1–296] and after I hear argument I will try to determine the decisive issues in this case.

But as I say, I don't want to do anything that will cut either side out of introducing testimony that they genuinely feel is very material for the protection of the rights of their clients, and that's the reason.

I recognize, that testimony that the Court let in, not this man, who was that other one, the supervisor of these——

Mr. PEDERSEN. Dr. Ripley?

Mr. WAGNER. Mr. Fitz.

The COURT. Mr. Dougherty, I don't mean to receive any of the things that these sky divers told him, anything that they brought up, showed to him, any public record or permanent record that they made of what they found and is a permanent record of TVA, I think that would be competent.

But just because some of them told him that they made a dive at such and such a place at such and such a time and what they did, I don't think, Mr. Pedersen, that is competent to prove facts, to prove facts; that would be hearsay.

Mr. PEDERSEN. Except that he stated that they had to report to him daily.

[1–297] The COURT. Well, if they made, if that's a written report of record, I think it would be competent as a part of the permanent records of the TVA. I think it would.

Mr. PEDERSEN. Yes. That's what he testified from.

Mr. DOUGHERTY. I don't think there is any evidence of any written daily records that he submitted to Mr. Fitz, Your Honor.

Mr. WAGNER. Well, Your Honor, if that's Your Honor's ruling I could ask him just for a moment about their divers, and so forth that worked under Mr. Fitz and how he prepared some——

Mr. DOUGHERTY. Could we start that in the morning, you think?

Mr. WAGNER. That would be fine.

The COURT. All right. You men ought to stipulate. His testimony is not going to be decisive of this case, I will tell you now, both sides, but you ought to agree as to what is competent and what isn't competent.

Mr. WAGNER. Thank you, Your Honor.

The COURT. You had evidence courses over here. You got two professors over here.

Mr. DOUGHERTY. They have been writing notes [1–298] all day, Your Honor.

The COURT. They ought to be experts in evidence.

Adjourn court until 9 o'clock tomorrow morning.

[At 5:06 p.m., court adjourned until 9 o'clock a.m., Friday, April 30, 1976.]

[2–1] SECOND DAY OF TRIAL

[Friday, April 30, 1976]

[At 9:05 a.m., court convened pursuant to adjournment, when the following proceedings were had.]

The COURT. Let the witness return to the stand, please.

Mr. PEDERSEN. Before we begin, Your Honor, the witnesses who have already testified, some of them have asked if they may sit in the courtroom now.

The COURT. Without objection they may.

Mr. DOUGHERTY. I have no objection.

The COURT. Yes, sir.

Mr. WAGNER. I have one or two more questions from this witness.

CHARLES F. SAYLOR, a witness called on behalf of the defendant, having been previously sworn, resumed the stand, was examined and further testified as follows:

DIRET EXAMINATION—CONTINUED

By Mr. WAGNER:

Q. Mr. Saylor, I have just a couple other questions for you. Have other species of darters been found in the Watts Bar Reservoir and the Chickamauga Reservior?

A. Yes, sir.

Q. What other species of darters have been found [2–2] in the Watts Bar Reservoir?

A. Gilt darter, river darter, and log perch.

Q. Are any of these species of the same genus and subgenus that the snail darter is in?

A. The log perch is in the same genus, and the river darter is in the same genus in the same subgenus.

Q. Okay. What about in the Chickamauga Reservoir, have any other species of darters been found there and, if so, what?

A. Log perch and river darter.

Q. Okay. Have photographs of the substrate at the Hiwassee River at the transplant site been taken?

A. Yes, sir.

Q. Have also photographs or slides of the substrate in the Little Tennessee River been taken?

A. Yes, sir.

Q. I hand you Exhibits 60 and 61 and ask you if can identify them?

A. This is 60, that's a photograph of the substrate from the Little Tennessee.

Q. Okay.

A. Probably Coytee Springs.

Sixty-one is substrate of the Hiwassee at the first transplant site.

Q. Is that the upper transplant site?

[2–3] A. Yes, sir.

Q. Are there large areas that contain substrate of that nature in the Hiwassee River?

A. Yes, sir.

Q. I would also like to show you Exhibits 62 and 63 and ask you if you can identify them?

A. Yes, sir. These are photographs of the Hiwassee transplant site.

Q. The upper site?

A. Upper site.

Q. Now, how far away are the other two transplant sites from this upper transplant site?

A. Three transplant sites are approximately one mile apart from each other, as you go down the stream.

Q. Is there current or flow in the upper reaches of the Watts Bar Reservoir?

A. Yes, sir.

Q. Will there be current or flow in the upper reaches of the Tellico Reservior?

A. Yes, sir.

Mr. WAGNER. That is all.

CROSS EXAMINATION

By Mr. DOUGHERTY:

Q. Mr. Saylor, I believe you have a B.S. in zoology from the University of Tennessee?

[2–4] A. That is correct.

Q. You do not in any way have a Master's degree or any Ph. degree in zoology or ichthyology?

A. No, sir.

Q. And since your graduation from the University of Tennessee you have been employed by TVA, essentially for the last two years or thereabouts?

A. Yes, sir.

Q. I believe while you were at the University of Tennessee you took some courses under Dr. Etnier?

A. Yes, sir.

Q. And would it not be fair to say that you have considerable respect for Dr. Etnier as an ichthyologist?

A. Yes, sir.

Q. And also considerable respect for Wayne Starnes as an individual who has engaged in quite an intensive study of the snail darter?

A. That's correct.

Q. You have met Dr. Raney, have you not, who is here on behalf of the TVA and has been called to testify as an expert witness?

A. Yes, sir.

Q. And is it not a fair statement, Mr. Saylor, that in your talks with Dr. Raney you have not been able to tell if Dr. Raney is an expert on the snail darter or not?

[2–5] A. Most of my conversations with Dr. Raney has not involved questioning him on his knowledge of the snail darter; therefore, I would hestitate to say that I am familiar enough with his knowledge of the snail darter to say that he is an expert.

However, I can say that he has had access to all of our field notes and our data and that he is an expert ichthyologist, and

he is also one that encouraged us to search in the main Tennessee River.

Q. The point that I am asking, is it not a fair statement in your conversations with Dr. Raney you were not able to tell whether he was an expert on the snail darter or not? Did you not give me that answer when I asked you that previously?

A. That's right.

Q. All right. You would agree, would you not, when you are diving in depths of water, let's say in the 10-foot to 15-foot area, that it is quite difficult to see fish and identify fish?

A. Yes, sir, that has already been established.

Q. And obviously the best way to determine whether something you are able to catch and collect is of a particular species is actually to collect it and take it back to the laboratory and examine it?

A. That's the most positive way. If you can get [2–6] within 2 feet, say, if you've got the visibility, some fish that are very distinct can be identified.

Q. And would you not agree that there are certain species of fish even among the darters that resemble each other in considerable ways?

A. Oh, yes.

Q. For example—may I approach the witness, Your Honor?

The COURT. Yes.

Q. [Continuing.] If I showed you this and you were down under water 15 feet with a face mask on and considerable dark and this sort of thing, and you saw a fish 2 feet away, wouldn't you agree it is a little difficult to tell precisely what it is from a distance of, say, 2 or 3 feet down deep in the water?

A. Yes.

Q. Can you tell me from 2 or 3 feet away right here in this courtroom what this is?

A. Yes, that's the Percina Ouachitae.

Q. You have looked at that before, haven't you?

A. Yes, sir.

Q. In the courtroom?

A. Yes.

Q. So you know what it is?

A. Correct, but you can recognize the remnants [2–7] of the fifth saddle at the caudal insertion.

Q. And that is a snail darter, isn't it?

A. That is correct.

Q. You are sure?

A. Yes, sir.

Q. Well, you hesitated?

A. Well, unless, now, I couldn't be sure. I knew this was a snail darter because I have been informed all these come from the Tennessee River system.

Q. And you looked at this yesterday too, didn't you?

A. Oh, yes.

Q. And I show it to you now, even though you looked at it yesterday, you are still a little bit unsure?

A. Well, knowing it came from the Tennessee River system, I know it's a snail darter.

Q. Of course, you are relying on what information we have given you in that instance?

A. Yes. The Tennessee—otherwise, I couldn't say.

Q. When you look at these two from a distance of, say, 2 or 3 feet, and suppose you are down underwater 15 feet with a face——

Mr. WAGNER. Your Honor, let the record show he is about 4 feet away at this time.

[2–8] [Laughter in courtroom.]

The COURT. Now, we must not have any more of this laughing out. This is a courtroom and we must conduct ourselves as if we are in a courtroom, which we are, and let's refrain from outbursts of that kind, please.

Mr. DOUGHERTY. Your Honor, I am not trying to be precise as far as distances are concerned.

The COURT. I know. Let's keep our minds on the subject.

The WITNESS. I understand.

The COURT. And continue your examination, leave out this frivolity, please.

Mr. DOUGHERTY. I was not trying to interject frivolity.

The COURT. Go ahead, go ahead, go ahead.

By Mr. DOUGHERTY:

Q. And if you are down underwater, let's say 15 feet, and you agree I am about 2 or 3 feet from you, with a face mask on, it is dark and you have difficulty seeing at best, wouldn't you agree it is a little difficult to distinguish one species from another when it is swimming and moving rather rapidly?

A. Well, it depends on whether the fish are very much alike. Yes, you would have if they are very much [2–9] alike.

Q. And isn't it true that if the fish are moving sometimes you make a mistake in identification initially until you are able to actually catch it and examine it later?

A. Yes, sir, that is correct.

Q. All right. Would you agree in looking at this that this is a snail darter?

A. If you tell me it came from the Tennessee drainage, I would, and you have.

Q. I am telling you that it is.

A. Yes.

Q. I am trying to be fair with you.

A. Yes.

Q. And that is the Percina Ouachitae?

A. Yes.

Mr. DOUGHERTY. May we introduce these as exhibits, this being the snail darter—right?

The WITNESS. Right.

Mr. DOUGHERTY. And this being Exhibit No. 110.

[Exhibit No. 110 was filed.]

Mr. DOUGHERTY. And the second vial containing the Percina Ouachitae, being Exhibit 111.

[Exhibit No. 111 was filed.]

By Mr. DOUGHERTY:

[2–10] Q. Would you not agree, Mr. Saylor, that it is a proper scientific method that if someone, for example, makes a find or ascertains something that they consider of significance in diving or in some scientific effort whether it is collecting or examining a transplant site or what-have-you that they make those notes the same day that the activity is engaged in?

A. If at all possible, yes, you should make notes the same day.

Q. Now, you would agree, would you not, that you are not an expert on the sexual progression of the snail darter nor on the reproductive aspects of the snail darter?

A. On the, well, yes, I will agree I am not that familiar with it.

Q. In fact, you have previously testified in deposition and you have admitted that you were not an expert on the reproductive processes or features of the snail darter?

A. Not an expert. I could tell you when they were, you know, by examining. Generally, I could tell you when they are reaching spawning, by appearance.

Q. And, really, that would be merely a gross visual observation of the species?

A. Yes, sir, that's right.

Q. And, really, someone with a little training could ascertain that by looking at the species?

[2–11] A. Yes, sir.

Q. And so you really do not feel you are qualified enough to testify as an expert about the reproductive processes or sexual progression of the snail darter?

A. Not on- -well, on the females you have to dissect and examine the eggs and stuff, and I haven't done that; no.

Q. You haven't done that.

Now, is it not a fact that though the TVA crew and others have engaged in considerable effort to find the snail darter in the area of the Little Tennessee River above river mile 17 and generally from 411 Bridge up to the Chilhowee Dam, in other words, from the 411 Bridge up to the Chilhowee Dam?

A. Yes.

Q. The upper 17 miles. That though you have engaged in considerable effort trying to find the snail darter in that area you have not been able to find a single snail darter in that area?

A. We haven't yet. I don't know you should say considerable. We haven't completed our search up there yet.

We've done—we have done rote samples, but the nature of these samples is, you have to get a small area behind an island where you can, you know, block off the flow [2–12] with a net so you catch the fish.

Q. Haven't you, yourself, engaged in efforts to find the snail darter above 411 Bridge, from there to the Chilhowee Dam, and you have not found the snail darter?

A. Not recently I haven't. I haven't been on any recent searches up there.

Q. You have been involved in this full time on the snail darter program since June of 1975, every working day since that period of time?

A. Yes, sir.

Q. And you have searched, according to a list which Mr. Pedersen prepared for me and which is an exhibit, roughly 60 or 70,

water courses of lakes or rivers in this East Tennessee area and North Carolina, Alabama, and you have not been able to find a snail darter?

A. I would like to make a correction, where the misunderstanding is here. Most recently we have been looking by snorkeling and scuba in the upper part. During that time I was not on the snail darter. I was preparing to go to some meeting in New Orleans and didn't make the trip. That's where the misunderstanding is.

Q. Well, when I say recently I am talking about over the last month or so. I realize you were at the meeting of the Association of Southeastern Biologists in New Orleans this past week. [2–13] A. Yes.

Q. But I am talking about over the last several months, you all have endeavored to find the snail darter in the upper Little Tennessee and have not found it.

A. No, we haven't found it.

Q. Now, yesterday—Your Honor, could I approach the witness?

The COURT. Yes.

Q. [Continuing]. Yesterday, Mr. Saylor, we had a little discussion about the fact that the observation of the approximately sixty- to seventy-five snail darters in the area of the Tellico Dam and whether this was the Little Tennessee River or the Watts Bar Reservoir. Do you remember that?

A. Yes.

Q. Now, would you please identify for me, this is the Little Tennessee River, is it not?

A. Correct.

Q. And it goes down here to the confluence of the Watts Bar Reservoir; correct?

A. Yes.

Q. Now, is it not correct that the area where you observed the sixty-five to seventy snail darters, and the one that you observed at the 27-foot depth with the photograph that was taken, the depth gauge, was actually in the area above what was the old mouth of the Little Tennessee [2–14] River in the Watts Bar Reservoir?

A. It was in this area starting at the point, right here. See where that line goes across, that line right there, about where that line goes is approximately where we took that photograph.

Q. OK. And that is above the mouth of the old Little Tennessee River and is in an area where there is fast moving current?

A. I wouldn't say fast. There is current there.

Q. OK. And, in fact, when you denoted this so-called find you designate it as river mile .2 and .3 of the Little Tennessee River?

A. Yes, sir.

Q. And did not designate it as the Watts Bar Reservoir?

A. Yes, sir.

Q. And is it not in all probability the fact that these snail darters that you found in this location migrated down the Little Tennessee River and got caught below where the dam is being constructed in the Little Tennessee River?

A. Whether that is highly probable or not, I hesitate to say, but that's probability.

Q. And even these three that you found out here below the confluence of the Watts Bar Reservoir were within the current area of the Little Tennessee River where it comes [2–15] into the Watts Bar Reservoir?

A. One of those was but the other two were not. They were in the main channel.

Q. But at most they were about a thousand feet below that location, or fifteen hundred feet?

A. Something of that, yes, sir.

Q. A fair statement.

Now, when you testified on direct examination, Mr. Saylor, you made the statement, and I made a note here, that the transplant appears successful in the Hiwassee River.

You are not saying with reasonable scientific certainty that the transplant is successful in the Hiwassee River, are you?

A. No, we are not definitely sure of that; no, sir.

Q. And, in fact, you have no definitive evidence that there is actual successful reproduction of the snail darter in the Hiwassee River?

A. May I give an explanation along with the answer?

The COURT. Now——

The WITNESS. It is not going to be long.

The COURT. Answer it yes or no if you can, and if you can't tell him, and then if you want to make a relevant explanation you can.

[2–16] Read the question to him and if you can answer it yes or no.

Mr. DOUGHERTY. I will be glad to restate it.

A. No, we haven't, but we are still in the process of taking our ichthyo plankton samples there. We have run into many difficulties in our collections.

Q. In fact, when I took your deposition approximately a month ago you were still taking ichthyo plankton samples?

A. Nor have we collected any in the Little Tennessee either, which was also an indication of our difficulties.

Q. Would you not agree that the only eggs—when you say ichthyo plankton, just to be simple about it, we are talking about fish eggs, aren't we?

A. And fish larva.

Q. And larva being the embryonic development of the fish eggs. Do you understand what I am talking about?

A. The outside of the eggs?

Q. Yes.

A. Yes, sir.

Q. And the only eggs you have found in the Hiwassee River have been Percidae eggs, eggs from the Percidae family; correct?

A. Correct.

[2–17] Q. Two that you were able to identify?

A. As the Percidaes.

Q. Would you not agree that there are at least ten species of the Percidae family other than the snail darter in the Hiwassee River?

A. At least that many.

Q. And all you can say about these eggs, they are from the Percidae family and you can't even be sure they are snail darters; a fair statement?

A. Well, no. There are other Percidae fish that we know of spawn that early though.

Q. Were you aware that one of the, another family of fish, a species Percichthyidae, which is the white bass, also spawns at the same time and has the Percidae egg or has an egg with the anterior oil globule on the anterior end?

A. I am not that familiar with it, but I do know the fish do spawn at that time.

Q. The white bass?

A. Yes.

Q. So those eggs could be as much white bass eggs as they could be snail darter eggs?

A. We haven't taken any white bass in the Hiwassee though. It may be there.

Q. You are not aware of the fact that the [2–18] Percichthyidae or white bass is in the Hiwassee?

A. It may be but we haven't sampled it.

Q. All right. Now, would you not agree that at this point in time the significant or major portion of the range of the snail darter, as far as population that you have been able to find at this point, is in the Little Tennessee River?

A. No—I am sorry. I didn't hear. I was thinking of something else. Could you repeat that. I am sorry.

The COURT. Read the question, Mr. Ford.

[The question was read by the reporter.]

A. So far our searches have indicated that.

Q. And I believe you would agree that the estimates of Wayne Starnes in terms of population of at least ten thousand, probably in excess of that, in the Little Tennessee River of the snail darter is substantially correct?

A. No. I don't see how you could arrive at any figure. There is a good number there though.

Q. You have no information about that yourself?

A. No, sir.

Q. And have nothing in terms of scientific data yourself?

A. No, sir

[2–19] Q. Is it not a fact that following this supposed find by David A. Turner of the observation of the either one or two snail darters in the Chickamauga Reservoir below Watts Bar Dam, you had a telephone conversation with Wayne Starnes?

A. Yes, sir.

Q. And you indicated to Wayne Starnes that you all were not sure that this was a snail darter and the members of the crew sort of doubted that David Turner actually saw what he said he saw?

A. No, sir, that's wrong. I didn't mean to make that impression. I don't think I did. It was more of a surprise and curiosity, was my emotions at the time.

Q. But let me ask you this precisely: Is it not a fact that you told Wayne Starnes that the other members of the crew had con-

siderable doubt as to whether David Turner had actually seen a snail darter below Watts Bar Dam in the Chickamauga Reservoir?

A. No, sir, I did not say that the other members of the crew doubted his find.

Q. Did you indicate to Mr. Starnes that you had considerable doubt that he had actually seen a snail darter?

A. I didn't think I did.

Q. Is it possible that you made such a statement to Mr. Starnes?

A. I did say, you know, exactly what I was doing [2–20] at the time was eliminating other fish that it might have been mistaken for if there was a mistake.

I talked to David and he said he made a positive I.D., that is all he told me. And exactly what I said was, "Well, Wayne, I don't know, you know, what else could it be?"

I said, "Log perch, sometimes when they get, you know, faded in these darker waters, they do have four bands that do come out." I don't know what else it could be.

Q. Is it not a fair statement that when you talked with Mr. Starnes, after your conversation with David Turner, this diver, that you in your mind had considerable doubt about it, sufficiently to communicate to Mr. Starnes that you were not sure that it was a snail darter, and you had doubt that it was?

A. Not Mr. Turner's find, no.

Q. Pardon me?

A. Not considering Mr. Turner's find.

Q. I am not sure I understand your answer. Let me ask you——

A. The other members of the crew had seen darters that could not be identified too.

Q. The only point I am making is, to make it short and to end it is this: Did you not communicate to Mr. Starnes that after you had talked, and this was a conversation with Mr. Starnes after you had talked with David Turner—[2–21] right?

A. Yes, sir.

Q. And did you not communicate to Mr. Starnes in that conversation that you had in your mind doubts as to whether he had actually seen a snail darter and properly identified it as such?

A. I don't believe I did.

Q. You deny under oath you made such a statement, Mr. Saylor?

A. I am saying that I did not tell Wayne that I didn't think Dave had made a good identification.

Q. Did you not communicate——

The COURT. Now, that's enough on that. Go to something else. That is all I want to hear on that.

By Mr. DOUGHERTY:

Q. Now, Mr. Saylor, there has been 771 snail darters transplanted at three sites in the Hiwassee River?

A. I'm not sure it's 771. I thought it was 710.

Q. All right, 710.

A. Okay.

Q. And since the transplant, the first one being in June of 1975, another one being this winter, 1976——

A. Yes.

Q. I believe the most you have seen of that [2–22] transplant population of snail darters is approximately a hundred?

A. That's a rough estimate; yes, sir.

Q. In fact, it may be less than that?

A. Maybe. I am not sure.

Q. And yet you all have looked extensively in the three transplant sites to locate other snail darters and of the 710 you have only even been able to see a hundred or less?

A. Maybe a hundred or more, too; yes, sir.

Q. One hundred is a fair estimate, isn't it?

A. Yes, sir.

Q. Okay.

Is it not also a fair statement that above the 411 Bridge in the upper seventeen miles of the Little Tennessee River where you tried to find the snail darter, that part of the process of trying to find the snail darter has been to inject poison into some of these areas and kill the fish and then try to identify what they are?

A. On one collection effort we did that.

Q. And in that instance where you poisoned fish in that area you again found no snail darter specimen?

A. Yes, sir. That was in the fall of 1974.

Q. And would you not agree, Mr. Saylor, that the area above the 411 Bridge has—let's put it this way first—[2–23] less areas

of similar habitat as Coytee Springs for the snail darter as above—excuse me, as below the 411 Bridge?

A. Yes, sir, I will have to agree with that.

Q. And would you not further agree that even, if assuming your hyopthesis that the snail darters could move upstream after impoundment, that the effect of impoundment would be to significantly decrease, at the very least, the population of the snail darter in the Little Tennessee River?

A. Well, that is just an opinion but yes, that is probable.

Q. And in that sense the impoundment of the Tellico Dam would destroy and modify the critical habitat of the snail darter in the Little Tennessee River and would jeopardize the continued existence of at least a good portion of the snail darter population; wouldn't you agree with that?

A. In the Little Tennessee River, yes.

Q. Now, would you not agree that the best way to examine a specimen such as a snail darter and determine its condition of health and its general overall condition is to dissect it?

A. Yes, sir.

Q. And as far as the two specimens that you collected in the Watts Bar Reservoir, one at the confluence about a thousand feet below the mouth of the Little Tennessee and the other four miles down, of the eight specimens that [2–24] you all have supposedly seen below the mouth of the Little Tennessee River, those are the only two that have been collected?

A. That's right.

Q. And those two were turned over to Wayne Starnes?

A. Yes, sir.

Q. And Mr. Starnes has indicated to you that those two specimens were nutritionally deficient?

A. Yes, sir.

Q. Even though one of them was a gravid female and still had the eggs, the one at four miles downstream?

A. She may have been partially—she appeared to be partially spent to me, or something of that nature.

Q. Isn't it a fact that that specimen at four miles downstream was still gravid and still had the eggs within it?

A. Yes, sir.

Q. A fair statement?

A. Yes, sir.

Q. And would you not agree that fish can very frequently live in an area and not reproduce in those areas?

A. That's——

Q. Let me give you an example——

[2–25] A. It is kind of hard to answer that because——

Q. Isn't it a fair statement that in the Little Tennessee River we have trout that are stocked in that area but they don't reproduce in that area?

A. As far as we know, they don't.

Q. And would you not consider an essential part of a critical habitat of a fish species that it be able to reproduce in that area?

A. Yes, sir.

Q. You all have no definitive evidence at this point in time that these snail darters that you supposedly observed in Watts Bar, have in any way been able to reproduce in those areas?

A. There is no definite evidence that, I think Gary Hickman may have seen——

Q. I'm talking about you, yourself.

A. Okay. I haven't observed any definite evidence, no.

Q. In fact, you really haven't seen any evidence of reproduction, of successful reproduction in the Watts Bar area where you have observed the snail darter?

A. No more than the existence of the fish there.

Q. In fact, that's really what it is, all you have seen is that you have seen some specimens of snail darters in that location?

[2–26] A. That is correct.

Q. And would you not agree that at the very minimum those that were found in the area were of a thousand or fifteen hundred feet below the confluence of the Watts Bar and the Little Tennessee, more probably got there by coming down through the Little Tennessee River?

A. More than probably?

Q. I say, more probably.

A. I couldn't say that.

Q. You couldn't say to the contrary either, could you?

A. No.

Q. And is it not a fair statement that the professional ichthyologists agree, such as Dr. Etnier, that the real habitat or the primary habitat for the snail darter is an area where you have the clean gravel substrate with some current?

A. That's Dr. Etnier's opinion. I haven't heard any of the other ichthyologists make statements on that.

Q. You haven't heard any of them express contrary opinions, have you?

A. No, sir. I haven't been present during their depositions or anything.

Q. And yet in your own mind you do not know from a scientific point of view why the clean or the sandy [2–27] gravel substrate is important?

A. No, sir, I don't.

Q. You don't have sufficient scientific background to draw any conclusions in that regard?

A. Well, there hasn't been enough work done.

Q. Isn't it a fair statement that when TVA first engaged in the transplants in the Hiwassee River in June of 1975, that TVA did not tell the State of Tennessee nor the Department of Interior that they were engaging in that transplant?

A. I wasn't involved in those business dealings between TVA and the State and the Department of Interior, so I really don't feel authorized to make any statement about it.

Q. But aren't you aware of the fact that the State of Tennessee and the Department of the Interior were not notified of TVA's transplant in the Hiwassee River in June 1975?

A. Was that before the fish was put on the list?

Q. Yes.

A. Yes, sir. I think maybe we did do it without notifying those people first.

Q. Without notification?

A. I am not sure; I am not sure.

Q. In fact, the only way the State of Tennessee [2–28] found out was when some of their biologists in the Tennessee River were doing some sampling and checking themselves and they found the snail darter there?

A. I am thinking that we did report—we did report to the State but we didn't report to the people in Crossville, and those were the people that did the sampling. But I think we did get in touch with the State.

Q. But isn't it a fact that in a meeting in January 1976, at which you were present, the State of Tennessee rather severely criticized TVA for not notifying the State of Tennessee about its activities?

A. Which meeting was this?

Q. A meeting in January of 1976 with the State of Tennessee Game and Fish people, Wildlife Resources Agency people?

A. Where was this meeting held? I can't remember being at that meeting.

Q. You don't recall such a meeting with the State people?

A. No, sir.

Q. And I believe you would agree that there are areas above 411 Bridge going to Chilhowee Dam, the upper seventeen miles, that you would consider inappropriate as habitat for the snail darter?

A. I wouldn't say that it was inappropriate [2–29] because we haven't done enough investigation in that area to make a firm opinion.

Q. Isn't it a fact that when I took your depositon on April 1, 1976, I specifically asked you that question and you answered yes? Would you like me to read the question and answer?

A. Yes, sir.

The COURT. Go ahead and read it to him.

Q. Is it not a fact, on Page 20, Line 16, are there areas up there that are inappropriate for the snail darter habitat, referring to the area above 411 Bridge, and your answer is yes.

A. There are areas up there that are inappropriate for it. I thought you were, you know, classifying the whole area, the whole seventeen miles.

Mr. DOUGHERTY. I think that is all, Your Honor.

The COURT. That is all. Call your next witness.

Mr. WAGNER. Could I ask him just a couple of questions?

The COURT. Not if you are going to repeat.

Mr. WAGNER. I am not going to repeat a thing, Your Honor.

The COURT. Well, what are you going to ask [2–30] him?

Mr. WAGNER. I want to ask him about the relative abundance based on their studies in the Hiwassee versus the Little Tennessee River. That's an area he got into that I did not ask him any questions about.

The COURT. All right, go ahead.

Mr. DOUGHERTY. I don't believe I even inquired into that

Mr. WAGNER. Yes, you asked him about how many they have seen there. Hiwassee.

REDIRECT EXAMINATION

By Mr. WAGNER:

Q. Have you doen relative abundance studies in the Hiwassee versus the Little Tennessee?

A. Yes, sir.

Q. What did your studies indicate?

A. The relative abundance of snail darters per unit effort in the Hiwassee——

Mr. DOUGHERTY. I don't think there is any evidence this man is even qualified to state.

The COURT. Well, maybe not, but I will hear it for whatever it is, it goes to the weight rather than the competency.

A. The number of snail darters seen per unit of [2–31] effort search in the Hiwassee are equal or more than the number of snail darters seen per unit of effort in the Little Tennessee River.

Q. Mr. Dougherty continues to ask you whether or not you have dissected these snail darters. Have we asked Interior for a permit to dissect and that permit has been denied?

A. Yes, sir.

Mr. DOUGHERTY. I object, Your Honor. I don't think that is proper to ask this witness.

The COURT. Well, it is already in and your objection is overruled.

Mr. WAGNER. That is all.

The COURT. Do you want to ask him anything?

Mr. DOUGHERTY. Just one question, Your Honor.

RECROSS EXAMINATION

By Mr. DOUGHERTY:

Q. I asked you earlier about the estimate of ten thousand snail darters in the Little Tennessee River, and isn't it a fact that you would agree that there are at least ten thousand snail darters in the Little Tennessee River? You would agree with Mr. Starnes' estimate at least in that regard?

A. Yes, I think it's, you know, as a guess, it [2–32] seems like it's a possible estimate.

Q. Don't you recall me asking you that precise question and you said at least, yes?

A. Yes, sir.

Mr. DOUGHERTY. All right.

The COURT. That is all.

[Witness excused.]

DAVID A. TURNER, called as a witness by and on behalf of the defendant, having been first duly sworn, was examined and testified as follows:

DIRECT EXAMINATION

By Mr. WAGNER:

Q. You are David Allen Turner?

A. Yes, sir.

Q. You live in Knoxville, Tennessee?

A. Yes, sir.

Q. You received a B.A. in biology from the University of Tennessee?

A. Yes, sir.

Q. What date?

A. It was the winter of '75.

Q. How long have you been working for TVA?

A. Approximately eight months.

Q. Okay. And what have you been doing for TVA since coming to work for them?

[2–33] A. Well, I first started on cove rote studies of the reserviors, and I was, when that project was ended in the late summer, I was put on the snail darter conservation program.

Q. And how long have you been on the snail darter conservation program?

A. Since October of 1975.

Q. What type work have you been doing in the snail darter conservation program?

A. Well, we started as—I started as a member of the seineing crew and sampling the Little Tennessee River and its tributaries beginning——

Q. What does that consist of, the seineing crew?

A. It consists of six men.

Q. I mean, what type work do you do?

A. We just go to a picked site on the river and seine up different fish and identify these fish.

We were in search of the snail darter in the tributary of the Little Tennessee River.

Q. And what other additional work have you done in the conservation crew?

A. Well, in November we started on benthos, taking benthos samples at Coytee Springs and Pilot Island area.

Q. What is that?

[2–34] A. That is bottom fauna, taking bottom fauna, comparing, taking the bugs off the bottom, extruded organisms for the fish to eat.

We also, like, I did benthos studies on the Hiwassee River at our transplant sites on the Hiwassee River.

Q. What other work have you done in the conservation program?

A. I was doing a study of the population, relative abundance, also taking stomach samples from the predator fish by shocking, electrofishing, and in the diving of the Tennessee reservoir.

Q. In your work with TVA in the past eight months, approximately how many snail darters have you seen?

A. Over a thousand, conservatively.

Q. Are you able to distinguish a snail darter from other darters in the Tennessee River?

A. Yes, sir.

Q. Are you able to distinguish snail darters from other fish in the Tennessee River?

A. Yes, sir.

Q. Are you also able to do the same in the Little Tennessee River?

A. Yes, sir.

Q. Have you done this many times?

A. Yes, sir.

[2–35] Q. Did you have occasion to specifically go on a dive in the Chickamauga Reservoir looking for snail darters?

A. Yes, sir, I have.

Q. On what date?

A. On April 19th. Well, that was the—we dove there before, earlier, I think the week before. We dove at Hunter Island, Hunter Shoals.

Q. That was also in the Chickamauga Reservoir?

A. Yes, sir.

Q. On that date did you see any, positively identify any snail darters on the previous——

A. No, sir.

Q. [continuing]. Time. All right. On April 19, of 1976, you say that you were engaged in diving operations in the Chickamauga Reservoir?

A. Yes, sir.

Q. And who else was with you on those operations?

A. Mike Quarrels, Roger Whittaker, and Rick Egger.

Q. And could you describe for the benefit of the Court precisely what happened on that date?

A. Yes, sir.

Q. Go ahead in your own words.

A. We were diving around river mile 515.4, [2–36] approximately 15 feet of water, the substrate was 98 percent sand and 2 percent smooth gravel with mixed boulders.

We had been diving, down for approximately thirty-five minutes and we came upon—we were diving going downstream——

Q. Were you scuba diving there and you had on scuba diving equipment, and so forth?

A. Yes.

Q. And could you describe for the benefit of the Court what type of rope you were on and where everyone was on the rope, and so forth?

A. Yes, sir. We have a dive line coming down from the boat and it's anchored. We have an anchor, using a precipitator weight. It's approximately a 20-pound weight to keep the line taut. And then we have a buddy line attached to the dive line, and we had four divers.

I was on the left, far left, and Mike Quarrels was to my immediate right and Roger Whittaker was to Mike's immediate right and Rick Egger was on the far right.

Q. And you all had been underwater for about thirty-five minutes?

A. Yes, sir.

Q. And you were moving downstream?

A. Yes, sir.

Q. And describe what happened.

[2–37] A. We were moving downstream like, came upon a small patch of gravel. There was a lot of sand, as I mentioned earlier, and I saw—we came upon—I was swimming like up over a boulder, small boulder, and from a dorsal view I saw two Percina tanasi.

Q. Now, what are these Percina tanasi?

A. Snail darters.

Q. Okay.

A. Two. I was able to observe these fish for approximately fifteen seconds.

Q. Now, how far were you away from the, how far were your eyes away from the snail darter?

A. A range of one to two feet.

Q. One to two feet?

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A. Yes, sir.

Q. And tell us exactly what you saw in the fifteen seconds that you observed them?

A. All right. One thing we look for is the key anatomical characteristics, and the pale metallic gold color is one of the characteristics of a snail darter, and the four dorsal saddles is another anatomical characteristic; had an angular head, and on one of the fish I saw it did have an elongated anal fin.

Q. What does that mean?

A. This puts it in the subgenus of the imostana, [2–38] and also it's a sexual dimorphic characteristic of a male of this species.

Q. So you were able to identify one as a male of the species?

A. Yes, sir.

Q. All right. And go ahead and tell us what you saw.

A. Well, I will recreate it as much as best of my ability.

Q. If you will.

A. Well, all right. We were swimming down, like, when I saw the fish I immediately keyed in on the fish, keyed in on one. I saw two, I keyed in on one to make positively sure that I did see a snail darter.

I had enough time to think not to breathe, not to blow bubbles because from previous dives, like when you do spot darters, shumardi particularly, river darters, by blowing bubbles they become frightened and they swim off.

So I was trying to alert the other divers of what I had seen. So I was tugging on the line, the dive line with a pretty good force, and Mike Quarrels, the diver to my immediate right, glanced over and was able to see the darter——

Mr. DOUGHERTY. I object to what Mr. Quarrels was able to see. He can't testify to that.

[2–39] The COURT. I sustain the objection. Just state what you saw, young man.

The WITNESS. Okay. I am sorry.

By Mr. WAGNER:

Q. Okay. Now, did you make positive identification before you jerked on the line?

A. Yes, sir, I did.

Q. And approximately how long did you observe these two snail darters before you jerked on the line?

A. Approximately five seconds. The darters themselves swam off in a direction toward the left, out and then back.

You have to understand by swimming along the bottom in a sandy area, and particularly you are going to, you are going to be sending up dust off the bottom, and the darters at that time swam into the dust and I was able to make, to see a lateral view of the darters that I had seen.

The COURT. How deep was the water you were in?

The WITNESS. 15 feet.

By Mr. WAGNER:

Q. How was the visibility that day?

A. Four feet visibility; three to four feet.

Q. Okay. And how close were your eyes to the snail darter?

[2–40] Mr. DOUGHERTY. I object. He has already asked him that.

The COURT. If you have, please do not repeat. I don't know whether you have or not. I will leave it to your honor. Have you asked him?

Mr. WAGNER. Yes, Your Honor, I have.

The COURT. All right. Don't ask it again.

By Mr. WAGNER:

Q. How long were those snail darters stationary before they swam away?

A. Approximately five seconds, or something like that.

Q. Okay. About the time that you jerked on the line then they swam away, they began moving?

A. Well, from the—I think the darters were startled by other divers there. They didn't know what I had seen.

We had stopped, like I stopped the divers by pulling back on the line, and they didn't realize what I had seen, so they had continued breathing, and noise travels pretty good through the water, and the darters did see me then at that time and did start swimming to the left and back into the silt.

Q. Did you get both a lateral and a dorsal view of these snail darters?

[2–41] Mr. DOUGHERTY. Your Honor, I object, he has asked him that question.

Mr. WAGNER. No, I haven't asked him that.

The COURT. All right, objection is overruled.

A. Yes, sir, I did.

Mr. WAGNER. You may ask.

CROSS EXAMINATION

By Mr. DOUGHERTY:

Q. Mr. Turner, you graduated from the University of Tennessee in the spring or thereabouts of 1975?

A. Yes, sir.

Q. And I believe it is fair to state you have not had any courses in ichthyology?

A. Yes, sir, that is true.

Q. That is true. You have no M.A. or Ph. D. degree whatsoever?

A. That is true.

Q. And aren't you primarily employed by TVA as a diver and technician?

A. No, sir.

Q. Isn't that a fair statement?

A. Well, not exactly. I am not employed as a diver. I am employed as a diver, that is part of my job.

Q. And isn't that the primary part of your job [2–42] is a diver?

A. At this point.

Q. It just happens you have a biology degree?

A. At this point it is important that I am a diver, but I wasn't employed in the beginning primarily as a diver.

Q. But, I mean, prior to your being employed by the TVA you had no experience whatsoever with ichthyology or any real study of fishes?

A. No, sir, I hadn't.

Q. And in terms of things that you engage in you are assigned to diving duties by Dick Fitz, primarily?

A. Yes, sir.

Q. And you perform whatever technical functions he asks you to do?

A. Yes, sir.

Q. And over the last two or three months, would it not be fair to say, that practically all you have done is engage in diving?

A. No, sir.

Q. Been a good part of it?

A. Been a good part of the last month.

Q. Some of it was collecting benthos organisms?

A. Yes, sir.

Q. And when you talk about collecting benthos [2–43] organisms, to put it in plain old laymen's terms, we are talking about getting out in the stream with a net or device to collect the organisms from the bottom of the stream?

A. Yes, sir.

Q. And in that sense you are a technician merely collecting these things to provide them for someone else to examine?

A. We were finding the areas of the river. We observed the river bottom, finding these areas where a particular substrate existed and taking this benthos from these areas.

Q. And you acting upon someone else's supervisions and instructions?

A. No, sir.

Q. Is it not a fact that of these crews that you are involved with there is a crew chief?

A. Yes, sir.

Q. And that person assigns you a specific function and duty during your daily task?

A. You have to understand that Mr. Quarrels and myself work as a team on the benthos, separate from the crew.

Q. That is in connection with the bottom organisms?

A. Right. It is our judgment—it's our judgment where we take them.

[2–44] Q. In connection with the bottom organisms?

A. Yes, sir.

Q. Let me ask you this, Mr. Turner. Would you not agree that when you are down 15 feet of water with a rubber wetsuit on and a face mask on and heavy diving tanks on your back and swim fins and down 15 feet in the water, it is much different than when you are observing something like in the courtroom as you and I and the Judge here today?

A. Yes, sir, that's safe to say.

Q. First of all, your visibility is much less than it would be?

A. Yes, sir.

Q. Sometimes the visibility may be almost in front of your face?

A. At times.

Q. And on this occasion your maximum visibility was three to four feet?

A. Yes, sir.

Q. In other words, beyond three or four feet you really couldn't see anything except just a haze?

A. Yes, sir.

Q. And in the water down 15 feet there are some problems about depth perception, would you not agree?

A. Yes, sir.

Q. And also some problem about identifying [2–45] colors?

A. At 15 feet there is not much problem identifying colors.

Q. Would you not agree that at 15 feet, for example, there are green casts and hazes and the light reflecting on the water, the light is refracted by the water and there are somewhat different colors than you would normally in effect see in a glass of clear water?

A. Of course, but, let me add this. Like in the bottom, on the very bottom, when you look at the, like you are out on the lake and you are just riding around in your boat and you look down and you see the green water, unless you go down on the bottom you can't really understand that there is light down on the bottom from the, reflected off the bottom and it is pretty intense.

Q. But is it not a fact that that light somewhat distorts your perception and it is much different than you and I looking at each other here in this room?

A. The mask distorts and the water.

Q. Oh, the mask and the water distorts.

Now, would you not agree that the proper scientific method in terms of a scientist who is making observations and making notes about the observations would be to make those observations and then make the notes the same day so that he puts down what is fresh in his mind?

[2–46] A. Yes, sir.

Q. I believe in this particular instance the memo that you wrote and delivered to Dick Fitz was not prepared until two days after your observation?

A. I think that's incorrect. That memo, of course, that was written as a request from Dr. Ripley, but the actual recording of the sighting was recorded that day.

Q. Where are your notes in that connection?

A. It is in the dive notes.

Q. Have you furnished them to your lawyer?

A. I don't know whether they have them or not. It is in that—we have been using these notes up until Thursday, or Wednesday.

Q. Well, what I am asking you is where are your dive notes in connection with this April 19th thing that you observed?

A. I don't know where the notes are particularly. Personally, I don't know, but we do have a record of this.

Q. This memo—excuse me.

A. At that date of the dive.

Q. This memo that you prepared dated April 21, two days after you supposedly saw this, was prepared from something else?

A. It is prepared from my memory.

Q. From your memory?

[2–47] A. Yes, sir, and from the data that we had collected that day.

Q. Would you not agree that the notes that you made that day would be more precise and accurate than something you did two days later?

A. No, sir, I wouldn't.

Q. You are just being very positive about it?

A. Yes, sir, I am.

Q. Would you not also agree that down underwater, say 15 feet, that species of fish, that there are certain species of fish even within the darter category that down in the water appear very similar and almost alike?

A. No, sir, not in the waters in which we dive. Like, of the, you know, if you take a species out of other rivers which are very similar and compare them, of course, they are a lot alike.

Q. Excuse me, isn't it a fair statement—I am sorry, go ahead.

A. I am sorry too.

Let me say this, that I thought that the darters that we observed in the Tennessee River, like the shumardi, the most numerous one, numerous, most abundant, down at the bottom, it looks nothing like the snail darter.

Q. Have you ever seen a Percina uranidea?

A. Yes, sir, in a vial.

[2–48] Q. In a jar somewhere?

A. Yes, sir.

Q. Have you ever seen a Percina Ouachitae?

A. Yes, sir, in a vial also.

Q. In a jar. Never seen it underwater?

A. No, sir.

Q. Would you not agree, for example, a Percina uranidea, Percina Ouachitae and Percina tanasi, which is a snail darter, have certain characteristics that are very similar and look almost alike when you are looking at them, say, in two or three feet?

A. I will agree that the Percina tanasi and the Percina uranidea look alot alike, and——

Q. Would you not agree about the same thing, about the Ouachitae?

A. Not entirely.

Q. Now, when you all were down in the water, just so we can be careful about this, you all were swimming side by side, the four of you?

A. Yes, sir.

Q. You on the left and then there was Mike Quarrels and Roger Whittaker and then Rick Egger?

A. Yes.

Q. And there was a boat up above and there was a rope with a weight on it?

[2–49] A. The boat is always behind us.

Q. OK. Anyway, there is a rope down with a weight on it?

A. Yes.

Q. And one of the fellows in the middle, in this instance, Mike Quarrels, he's the one that takes the weight and moves it forward as you swim downstream?

A. Yes, sir, that's correct.

Q. And you also have other ropes which connect each of you to each other?

A. Yes, sir, that is correct.

Q. Because it is kind of pretty dangerous down underneath the water?

A. It just depends on what you call dangerous. It's dark down there at times.

Q. It is dark down there, isn't it?

A. Yes.

Q. And, for example, there was a rope that you had in your hand and a rope that Mike Quarrels had in his hand?

A. Same rope.

Q. I understand that, but you all were connected by rope that you were holding in your hand?

A. Yes, sir.

Q. And you were also swimming at the same time?

[2–50] A. Finning.

Q. Finning, OK. Pulling your rope and finning, using the fins to propel yourself?

A. Yes.

Q. And is it not a fair statement that at the time you first observed these species of fish you saw two of them?

A. Yes, sir.

Q. And at that same instant you jerked Mike Quarrels' rope?

A. No, sir.

Q. You didn't at first?

A. Not at first.

Q. Didn't something sort of generate something and you jerked that rope?

A. I had enough time to think and observe these things and not to breathe. I mentioned that earlier.

Q. I understand that, but I am just talking about a couple of seconds. In other words, the thought went through your head stop breathing, and a few seconds later you jerked the rope? You only seen the thing fifteen seconds as you say, using your own estimate anyway?

A. Yes, sir.

Q. And didn't you tell me when I talked to you Tuesday that you jerked that rope as hard as you could and [2–51] you almost jerked Mike Quarrels' arm off?

A. Yes, sir.

Q. And immediately Mike Quarrels looked and Mike Quarrels cannot identify either of these fish?

Mr. WAGNER. Now, Your Honor, he objected to that a moment ago.

The COURT. Yes, you did. That isn't proper the way you are doing on that. You objected and I sustained your objection. Now you ask him a question like that, that is highly improper.

Mr. DOUGHERTY. All right, Your Honor.

By Mr. DOUGHERTY:

Q. And at most the specimens you observed were stationary for five seconds?

A. Approximately.

Q. And at that point they began swimming away; you supposedly keyed in on one and you really can't tell us much at all about the second one?

A. I only got a dorsal view of the second one.

Q. And really you just got a quick glance of the second one?

A. A quick glance, enough to know it was a Percina tanasi.

Q. And isn't it a fair statement with this mask on, 15 feet down, and when you say you saw these specimens, [2–52] say, a foot or two away for about five seconds, then they started swimming away from you?

A. You have to understand they were swimming in such a manner that they weren't more than two feet from me, at most.

Q. But you still only keyed in on one, didn't observe the second with any precision?

A. That's right, but one was enough.

Q. Again you are just as positive as you could be?

A. Yes, sir.

Q. And would you not agree that someone who is engaged in scientific activity, before they come up with any firm conclusions, that this is something that should be studied and thought about carefully; is that not correct?

A. I think that, Mr. Dougherty, that if you have seen as many snail darters as I have seen in underwater conditions, and you see a snail darter for the length of time that I saw a snail darter, that you can positively identify, with no doubt in your mind, that it was a snail darter.

Q. Isn't it a fair statement, Mr. Turner, that practically all the snail darters that you have seen other than these you say you saw at Chickamauga, have been in the Little Tennessee River?

A. No, sir. In the Little Tennessee River and [2–53] the Hiwassee River.

Q. And in those areas it is much shallower, in fact we are talking about areas of maybe two or three or four feet deep at the most?

A. Yes, sir.

Q. And so the conditions of visibility compared to 15 feet as opposed to 2 and 3 or 4 feet is a quite different situation, isn't it?

A. Not really.

Q. Not really?

A. Not really.

Q. Again you are very positive?

A. The visibility on the Little T and on the Hiwassee River, it just depends upon the day. But visibility, you can't see 25 feet in front of you on the Little Tennessee River.

Q. May I approach the witness very briefly, Your Honor?

The COURT. Yes.

Q. [Continuing.] I show you two vials, one marked Exhibit 111 and another marked Exhibit 110, and keeping in mind that you are down underwater 15 feet and you only observe these stationary for about five seconds, or using your estimate of approximately five seconds, and then the fish begin to swim off; right?

[2–54] A. Yes.

Q. And, for example, can you tell me, I am holding it about two feet from your head, if I am wrong you correct me, and about two feet from your head and keeping in mind only stationary for about five seconds and then start swimming off, can you just tell me very quickly whether both of these are snail darters or whether one is a snail darter and one is not a snail darter, keeping in mind we are in the courtroom where you have a very clear opportunity to visualize it rather than 15 feet?

A. I don't think that is very fair because you have a preserved species, and like we were looking at live specimens on the bottom.

Q. Well, you have looked at these vials that I have had on my table; your lawyers have showed them to you?

A. OK.

Q. I am not trying to play games with you. I am just asking you to tell me——

A. I am not playing games either.

Q. About two feet from you and keeping in mind we are in the courtroom and not under 15 feet of water and you observed them about five seconds and they started swimming off.

A. Yes, sir.

Q. Can you just tell me——

[2–55] A. This appears to be a tanasi.

Q. And is the other one a tanasi or is it something else?

A. It looks like a uranidea.

Q. Looks like a uranidea. Now, by just looking at it you are saying that this appears to be a tanasi or snail darter, but you are really not sure, just looking at it, are you?

A. Unless you can get down and look at it really close it's hard to——

Q. What I am really saying is, even when you are observing it here in the courtroom you cannot say positively that it's a snail darter, can you?

A. I am going to say that this darter right here is a Percina tanasi.

Q. And you were saying a minute ago that it appeared to be a tanasi?

A. Yes, sir. It does appear and as far as I can tell it does appear to be a Percina tanasi.

Q. And again, since you have been sitting here you have been looking at all of this one and very little at this one, and you would not be willing to say positively which either one are or what they are, would you, in all fairness?

A. Yes. You have to understand, Mr. Dougherty——

[2–56] Q. I am asking you, if you would answer it and then explain.

A. All right. I have made the statement that this is a Percina tanasi.

Q. And are you saying that absolutely and positively?

A. I will make the positive statement that is a Percina tanasi.

Q. And, of course, we have been talking here for a period of time and initially you said it appeared to be?

A. But I haven't been looking at the specimen the whole time.

Q. You haven't been looking at the specimens the whole time?

A. No, sir.

Q. And you actually haven't had an opportunity to sort of study the specimens, have you?

A. No, sir.

Q. But yet you did look at them in the vial yesterday when your attorney showed them to you?

A. Yes, sir.

Q.And did you all discuss the specimens and point them out, which was which?

A. I positively identified the specimens there.

[2–57] Q. That is not what I asked you. Is it not a fact

that your attorney and the other members of your crew looked at all of these vials and I gave them to Mr. Wagner and all of you looked at them and determined what they all were yesterday before trial even started?

A. Yes, sir.

Q. Okay. And you are saying, for example, that you think 111, which I am holding in front of you, is the uranidea?

A. Yes, sir, it appears to be.

Q. It appears to be a tanasi?

A. The reasoning I am using on this is on the dorsal saddle of the tanasi, the dorsal saddle widen as they go down in the lateral lines.

Q. Now, Mr. Turner, I understand the precise description that you can give me that you all have talked about, but I am asking you, sir, looking at Exhibit 111 can you really tell me, you said that you thought that was a uranidea. Can you tell me positively that that is not a tanasi, again holding it about two feet from you?

A. No, sir, I can't.

Q. You cannot say it's not a tanasi?

A. I can't say that.

Q. And if I told you, in other words, just so we understand each other and then I will stop, you cannot tell [2–58] me, looking at this, that this is not a tanasi?

A. Right.

Q. In other words, you are saying that it could possibly be a tanasi?

A. That could be a uranidea there in your other hand.

Q. You are saying that Exhibit 110 could be a uranidea?

A. Sure it could be a uranidea, could be a tanasi either one. They could both be.

Q. You are really not sure what they are, are you, isn't that so?

A. I don't think it's fair for me to make a statement of positively identifying something unless I can get a closer look at two close specimens.

Q. Would you not also agree at 15 feet down where you only saw these for fifteen seconds and only five seconds stationary and the rest of the time, the other ten seconds, they were swimming off, and would you not also agree you cannot positively say it was a tanasi too?

A. I can positively say that this is a tanasi because the uranidea is not found in this area.

Q. Well, what if I told you that neither one of these were uranidea?

A. I would have to take your word for it.

[2–59] Q. You are really not sure, are you, Mr. Turner? In fact, you are willing to say to me that Exhibit 111 could be a tanasi even when you examined it here in the courtroom about two feet from your head, not underwater; correct?

A. I think, Mr. Dougherty, that——

Q. If you can answer my question and then the Court will permit you to explain it any way you would like to.

A. All right. Well, I think that, if I could explain what I am going to say——

The COURT. Well, can you answer the question yes or no. If you can, do that. If you cannot do that, tell him that you can't answer it yes or no.

The WITNESS. Well, I can't answer it yes or no.

The COURT. All right. Then say what you want to so long as it is relevant, but don't go into a long story about it.

The WITNESS. Yes, sir.

A. Like, you have two specimens in a vial with light reflecting off of the glass, and you are holding these and you are moving them like this—it's hard to make a positive I.D. because it is difficult.

I don't think I could do it and positive about it. It wouldn't be fair to the Court.

The COURT. I think we have had enough on [2–60] this. I think I can understand it as well now as I ever will if you keep for a half hour.

Mr. DOUGHERTY. One more question and then I will move on.

The COURT. One more question.

By Mr. DOUGHERTY:

Q. And you are telling us that you have better visibility and better depth perception with a mask on your face and in the water in front of your face in 15 feet of water, down 15 feet, than here in the courtroom where it is clear looking at the specimens in the vial?

A. It is completely two different situations.

Q. Completely two different situations. That will be all. Come around.

Mr. WAGNER. Your Honor, let me ask him just a couple of questions.

The COURT. What do you want to ask him about?

Mr. WAGNER. I want to ask him if the Ouachitae live in the Tennessee River.

REDIRECT EXAMINATION

By Mr. WAGNER:

Q. Does it live in the Tennessee River?

A. In West Tennessee, in the river, the way I understand it, it does live in the Tennessee River but not in this area, in this geographic area.

[2–61] Q. Are you all instructed before you go down never indicate that you spot a darter unless there is a positive identification?

Mr. DOUGHERTY. I object to what they are told. What he saw he has already told.

The COURT. Oh, yes. It is sustained.

Mr. WAGNER. That is all.

The COURT. That is all. Call your next witness.

[Witness excused.]

Mr. WAGNER. Your Honor, I would like to, Gary Hickman is the person we discussed yesterday and he has very brief testimony that is different from what Charles Saylor testified and I would like to ask him to testify on those points.

Mr. DOUGHERTY. Your Honor, we offered to stipulate his testimony yesterday afternoon and I agreed to shorten this matter. Now they want to bring him on. I don't see the point.

Mr. WAGNER. To prove the point, Your Honor, that Charles Saylor could not prove. Gary Hickman, after viewing this film, has seen similar activity in the Watts Bar Reservoir and he would like to describe it.

Mr. DOUGHERTY. They were aware of this before [2–63] and just whoever happens to be there can see it.

The COURT. I don't think we ought to bring this witness in. Bring in your expert. I am not going to let you do it.

DR. EDWARD C. RANEY, called as a witness by and on behalf of the defendant, after first being duly sworn, was examined and testified as follows:

Mr. PRESSLEY. This is Dr. Edward C. Raney of Ithaca, New York. He is sixty-six years old. He's a professor of zoology

emeritus at Cornell University. He has taught at Cornell University since 1936.

He is an ichthyologist specializing in systematics, which is classification of fish; ecology and behavior or fishes.

He holds a degree of Bachelor of Science in zoology, a Master of Science in zoology from Cornell, a Doctor's degree in zoology from Cornell.

He has supervised the training as chairman of the committee for forty recipients of Doctorate degrees and nineteen Master degrees.

He is a member of over two dozen scientific societies; former national president of American Society of Ichthyologists and Herpetologists, which is fishes and amphibian reptiles.

He is listed in American Men of Science, [2–64] Who's Who in America; author of more than a hundred scientific papers, and has written over three hundred articles on fishes for Collier's Encyclopedia.

He is the author of thirteen papers on darters, many of which are found in the Tennessee River system. The last paper on darters written in 1974 on the Banded Darter.

He has had more than thirty years experience in studying Southeastern fishes. He has formed his own private corporation under a name of Ichthyological Associates, Incorporated, at Ithaca, New York. He employs over two hundred biological scientists, including fish and wildlife.

I would like to file his complete biographical sketch which has already been marked.

[Exhibit No. 112 was filed.]

Mr. PEDERSEN. I would also like to file from the American Fishery Society a publication, No. 6, a list of common and scientific names of fishes from the United States and Canada.

[Exhibit No. 113 was filed.]

The COURT. Try to stay out of Canada if we can because we have enough to do here in the United States.

[2–65] Mr. PEDERSEN. All right.

DIRECT EXAMINATION

By Mr. PEDERSEN:

Q. When was your last publication on darters, Dr. Raney?

Mr. DOUGHERTY. I believe you have already made that comment.

Q. Did I state that?

A. 1974, sir.

Q. 1974. What was it?

A. It was a study of the banded darter.

Q. Have you described many fishes?

A. Eighteen, sir.

Q. And you have described how many darters?

A. Seven.

Q. Seven darters. By describing what are you saying?

A. These are fishes that are new to science, that heretofore had not been recognized or described in the literature.

Q. I see. And you have given a scientific description of the animal the same as a snail darter has been described in this case?

A. Yes.

Q. Are you familiar with the Tellico project?

[2–66] A. Yes, sir.

Q. As of what date?

A. As of 1972.

Q. You have been consulting with TVA for a number of years, have you?

A. Yes, sir.

Q. On fisheries matters?

A. Yes, sir.

Q. And have you visited the site of the Tellico site?

A. Yes, sir.

Q. In the Little Tennessee River?

A. Yes, sir.

Q. Have you gone from one end of it to the other, the Little Tennessee River?

A. Well, I have seen it in the upper end and then I have gone the Chilhowee Dam to the mouth of the Little Tennessee.

Q. That is what I mean, the area in which the project will be?

A. Yes, sir.

Q. Is that by foot or automobile or helicopter or how?

A. It's by helicopter and automobile.

Q. And have you been out on the banks and into [2–67] the water though at any places?

A. Yes, sir.

Q. Has TVA supplied you with various literature, photographs and data with respect to the programs that they are carrying on?

A. They have.

Q. You have consulted with them on a more or less regular basis, have you?

A. Yes, sir.

Q. Been out to their laboratory in Norris?

A. Yes, sir.

Q. Tell us a little bit about what studies, if any, you have made of the Tennessee River system and whether you have any collection of fishes from this area?

Mr. DOUGHERTY. Your Honor, I would object unless it is within the last ten years.

The COURT. You rely on the statute of limitations?

Mr. DOUGHERTY. Sort of, Your Honor.

The COURT. The objection is overruled.

A. As professor at Cornell and before that as instructor, systematics professor, I had thousands of students who were interested in fishes, and during spring vacation, and at other times, in the summer, we would come down to Virginia, North Carolina, some parts of Tennessee, and collect in the [2–68] headwaters as we were able with the kind of equipment that was available then that you could carry easily in a car with two or three or four students.

These specimens were taken back to Cornell and studied, and over the years has served as a basis for dozens of scientific papers, both describing species and giving a picture of how these species varied throughout their range.

These studies included fishes that occur in Tennessee, and occur elsewhere.

Q. Do you have a substantial collection of fishes at Cornell?

A. Yes. We have one of the better university collections in existence. I was curator of that collection for more than thirty years and it is a superb collection of fish.

Q. When did you first see a snail darter?

A. I first saw one on the 12th of November, 1974.

Q. Where did you see it and under what circumstances?

A. In Washington, D.C. I had a meeting with Charles J. Chance of the TVA in the TVA headquarters in Washington, and he had with him a vial that had a specimen of the so-called snail darter in it.

[2–69] Did you ever witness the collection of a snail darter?

A. Yes, sir.

Q. Tell us about that.

A. On the 24th of February, 1976, we were flying the Little Tennessee by helicopter. We landed at Coytee Springs, which is a type of locality of the snail darter in the area from which it was also taken.

At that time I went into the river with a Dick Fitz of TVA. We made an examination of a type of bottom, examined the type organisms that were on the rocks.

Shortly after we had arrived a group of young biologists from TVA appeared on the scene, took out a net and worked the shoal area and collected at least two specimens of the snail darter.

They put these in a bucket and brought them over toward shore and I had a chance to examine them. One was a male and the other a female.

Q. How many described darter species are there?

A. There are one hundred sixteen that have been described to date.

Q. Are there some that are undescribed?

A. Yes, sir. There are a supposedly twenty-five species that are undescribed in the United States. Most of these are in the Southeastern United States.

[2–70] There are nineteen of these undescribed species from the State of Tennessee.

Q. Are you familiar with the program of the TVA to conserve the snail darter and did you have anything to do with its preparation?

A. Yes, sir, I am familiar with the program and I was consulted in the early stage when the program was being drawn up.

Q. Did you review the final program as it was finally formulated?

A. Yes, and it's continued to be modified, and I have followed the progress and investigations.

Q. What is your opinion of this program, is it a sound scientific program?

A. It's an excellent program. It's a program being done in depth.

Mr. DOUGHERTY. We would object, Your Honor.

The COURT. What's the point in this, to show—undertaking to show good faith?

Mr. PEDERSEN. That is part of it, yes, Your Honor.

The COURT. I am afraid it's too general. Just ask him the specific questions.

I am afraid you are getting into too many generalities which are not helpful to the Court in [2–71] trying to reach a decision in the case.

By Mr. PEDERSEN:

Q. You are familiar with the transplant program, are you not?

A. Yes, sir.

Q. And how it's conducted?

A. Yes, sir.

Q. What is your opinion of the success of this transplant program?

A. The evidence to date indicates that this is successful. Darters have been transferred elsewhere and successful transplants have been made. I haven't any doubt inasmuch as 710 specimens were transferred that it will be successful.

Mr. DOUGHERTY. Your Honor, I object. I don't think the proper predicate has been laid on this question.

The COURT. I will let it go in subject to your objection.

By Mr. PEDERSEN:

Q. Do you have an opinion, Dr. Raney, with respect to the prospects of the snail darter surviving impoundment from the Tellico Dam?

A. Yes, sir.

Mr. DOUGHERTY. Same objection, Your Honor, [2–72] for the record.

The COURT. All right.

Mr. DOUGHERTY. If we might note a continuing objection, I won't repeat.

The COURT. Overruled.

By Mr. PEDERSEN:

Q. What is that opinion?

A. My opinion is that within the Tellico area that some will survive in the upper end of the Tellico Reservoir, and that there is a very good possibility that additional ones will survive——

Mr. DOUGHERTY. I object to possibility.

A. [Continuing.] And thrive——

The COURT. Now, possibility is too far afield. He has to testify, if he can, with reasonable certainty. He can't testify to probabilities.

By Mr. PEDERSEN:

Q. Can you testify with reasonable certainty?

A. Yes, sir; that the upper Tellico River, at a depth of approximately 5 to 10 feet, will serve as a satisfactory habitat for the snail darter after the dam has been closed.

Q. Do you know whether the snail darter, I mean, rather, the darter is found in other reservoirs?

A. Yes, sir.

[2–73] Q. You have been informed about the finding of the darter by the TVA biologists?

A. Yes, sir.

Q. Did that come as any surprise to you?

A. No, sir. I made the prediction more than a year ago——

Mr. DOUGHERTY. I object.

A. [Continuing.]—that it would be found elsewhere and it has been found where I predicted it would be found.

Mr. PEDERSEN. Wait just a minute.

The COURT. Yes, I will hear you, but, now, remember, you don't have a jury, Mr. Dougherty.

If you had a jury, I could see the point. I am not going to decide this case on incompetent evidence.

Now, as I stated yesterday, I have been very liberal with both sides, both sides have introduced testimony in this record which, in my opinion, is not competent to prove substantive facts.

Now, I will hear you on your objection, but you need not worry. I am not going to decide this case on incompetent evidence.

Now, Mr. Pederson, I am trying to plead with you to get this man, to pinpoint this man on the [2–74] determinative issues.

Mr. PEDERSEN. What I am trying to do, Your Honor, is this. I am trying to shorten it as much as possible without asking fifty questions where I think one would serve. That is the point I am trying to do.

The COURT. If you are trying to do that, the Court is for you 100 percent.

Mr. PEDERSEN. That is exactly what I am trying to do, Your Honor. I am trying to go as quickly as possible. I realize that the questions are somewhat broad, but I could ask them in fifty little questions. But that is really what I am trying to do.

The COURT. All right.

Mr. DOUGHERTY. Your Honor, I don't know of any court in the land, in particular Your Honor's court, that consider proper scientific evidence to be based on predictions.

The COURT. No, too indefinite.

Mr. DOUGHERTY. And for him to testify about predictions without supporting scientific data is incompetent, and I object to it.

The COURT. The objection is sustained as to the predictions, yes.

Mr. PEDERSEN. Now, here, Your Honor, is what I want to prove.

[2–75] The COURT. All right. Go ahead and prove it, prove it.

By Mr. PEDERSEN:

Q. You know where the snail darters were found in the other reservoirs, in the Watts Bar Reservoir?

A. Yes, sir.

Q. Before they were found there did you make any recommendation with respect to where TVA should look for them?

A. Yes, sir.

Q. Tell us about that?

A. I made the recommendation that we should look for the snail darter in Watts Bar Reservoir and in Chickamuga Reservoir. This obviously, sir, is a big river species.

Mr. DOUGHERTY. I object to that. There is no basis for that in the record whatsoever.

The COURT. Overruled. Let it go in for what it's worth.

By Mr. PEDERSEN:

Q. When you made the recommendations as to where they should look, how did you go about making your decision as to say to look here or look there?

A. First I became familiar with the areas where the snail darter was found in the Little Tennessee River, both having observed it in the type of locality and then [2–76] having flown over it several times and having traversed the entire

reaches that will be inundated. The basis of my experience with darters, the type of places that you could expect this big river darter to live.

We then flew over adjacent areas in Watts Bar and in Chickamauga.

Q. Is that by helicopter?

A. Yes, sir. And we flew over it in such a way, sir, that we could come down, disturb the water a little bit and the pilot would go back up, and then you would be in a position where you could see fairly clearly when the water was clear.

The COURT. Mr. Pedersen, I have high respect for this gentleman, but he is not helping the Court so far. That's too general, that's too general for the Court to base a decision on.

What he suggested I don't think that has anything to do with the determinative issues in this lawsuit, with all due respect to you and Mr. Dougherty.

Mr. PEDERSEN. I was going to go further, Your Honor, and show that not only did Dr. Raney suggest where they should look for them in Watts Bar——

The COURT. I don't think that has anything to do with it, his suggestion. It is what was found.

Mr. PEDERSEN. Well, his opinion as to where [2–77] he thinks they are found we think is material.

The COURT. You can ask him whether they can live in this section or that section, but what his suggestion is, that has nothing to do with the lawsuit, in the opinion of the Court.

Mr. PEDERSEN. All right.

By Mr. PEDERSEN:

Q. In your opinion, does the snail darter exist in other places in the reservoir than where they have already been found by TVA?

A. Yes, sir.

Q. And in what reservoirs do you think that they do exist?

A. In Watts Bar Reservoir and in Chickamauga Reservoir.

Mr. DOUGHERTY. Your Honor, I would object unless there is some supporting scientific data, of which there is none.

The COURT. Your objection goes to the weight and it is overruled. It is not as to the competency, in the opinion of the Court.

By Mr. PEDERSEN:

Q. Do other darters exist in reservoirs?
A. Yes, sir.
Q. What other darter?
[2–78] A. Well, at various places many other darters exist in reservoirs, but in this area log perch, gilt darters, dusky darters, and occasionally other species.
Q. Is the water in reservoirs stationary and stagnant or is there any movement in reservoirs?
A. In some part of all reservoirs there is movement, sir.
Q. Explain what you mean there?
The COURT. We are only interested in the reservoir that will be created by this dam, Mr. Pedersen, and those are too general to be helpful to the Court, those answers.
Mr. PEDERSEN. Well, let me explain to the Court because I think we are trying to shorten it perhaps too much and not go all the way into the late afternoon.
The impression is created here by questions of counsel that a reservoir is a stagnant pool. The fact of the matter is——
The COURT. I understand that. Now, what about these reservoirs that will be created down there at the Tellico Dam, that's the one I am interested in, the only one.

By Mr. PEDERSEN:

Q. After the reservoir, after the Tellico Dam [2–79] Reservoir is created will there be a movement and flow of water through that reservoir?
A. Yes, sir.
Q. What is the nature of that movement?
A. That is out of my area of expertise, sir.
Mr. DOUGHERTY. I apologize for objecting, but there's got to be some basis for scientific opinion and at this point——
The COURT. Your objection is overuled. Please don't interrupt anymore.
Your objection may continue throughout his testimony, but don't get up and interfere and take up a lot of time.
Mr. PEDERSEN. Of course, perhaps I am proving something that is well known.
The COURT. I don't want to hear from you either. Go ahead, ask the questions.
Mr. PEDERSEN. All right.

By Mr. PEDERSEN:

Q. Will the main stream of the Little Tennessee River still flow through the Tellico Reservoir after it is impounded?
A. Yes, sir.
Q. And is that same thing true of all the reservoirs along the Tennessee River, does the main stream of [2–80] the Tennessee River still flow through all those reservoirs?
A. Yes, sir.
Q. Then you do have a current in there?
A. Yes, sir, at places, sir.
Q. Yes. And does the velocity of that current, wherever you find it, have anything to do with your selection as to where these snail darters will exist, in your opinion?
A. Yes, sir.
Q. That is one of the elements?
A. Yes, sir.
Q. What other elements do you consider necessary in your decision as to where you think they exist?
A. The bottom type which exists in a given area.
Q. Describe the bottom.
A. The most that have been seen or taken to date has been taken over a combination of gravel, sand, which is moderately clean.
I have every confidence that it is probable that they occur in the old shoal areas of the reservoirs in the big Tennessee River system, and this is why I recommended we look and this is where we have found them.
Q. Describe the shoal area. What do you mean by a shoal area?
A. Well, a shoal area is in contrast to a very deep area of reservoirs. It's a shallow area. Normally, it [2–81] is swept by a swifter current and the bottom is kept clean or moderately clean in those areas.
Q. And it is these areas in the reservoir that you would detect from the air, is that what you say?
A. Yes, sir.
Q. Do you have any knowledge about transplanting of fish, whether that is common or a very unusual thing?
A. I have knowledge and it is a very common matter and it has been done for thousands of years in some parts of the world. In this part of the world it has been done successfully for more than a hundred years.

Q. Of many different species?

Mr. DOUGHERTY. I would object unless it is related to darters.

The COURT. Overruled.

A. [Continuing.] Many species and many occasions and hundreds of places.

The COURT. Your objection is on the record as to all of his testimony. You don't have to renew it, to all of his testimony.

By Mr. PEDERSEN:

Q. You say many different species of fish?

A. Dozens of species have been moved thousands of places over the last one hundred years. It is being done today and will continue to be done.

[2–82] Q. Your deposition was taken on March 30, 1976, in this case, was it, Dr. Raney?

A. I think it was the 29th of March, sir, 1976.

Q. I have it the 30th here.

The COURT. I won't adjudicate that, whether the 29th or 30th. Go ahead.

Mr. PEDERSEN. I want to file that as a part of the record, and to shorten this proceeding, Dr. Raney's deposition was taken in which he was examined at great length in very many areas in which this Court is not interested.

By Mr. PEDERSEN:

Q. Do you have an opinion, Dr. Raney, as to whether the snail darter reproduces in the Watts Bar Reservoir?

A. Yes, sir.

Q. What is that opinion?

A. It obviously reproduces or it would not be there.

Mr. DOUGHERTY. Your Honor, I must object to that answer and question.

The COURT. The objection is overruled.

Mr. DOUGHERTY. No scientific data to support it.

By Mr. PEDERSEN:

Q. Do you have an opinion whether it reproduces [2–83] in the Chickamauga Reservoir?

A. Yes, sir.

Q. What is that opinion?

A. It does I am certain reproduce in the Chickamauga Reservoir.

Mr. PEDERSEN. You may ask him.

The COURT. Take a short recess, gentlemen.

[A short recess was taken, after which the following proceedings were had.]

The COURT. Gentlemen, you may proceed with the cross examination.

CROSS EXAMINATION

By Mr. DOUGHERTY:

Q. Dr. Raney, prior to February 24, 1976, when you went to the Coytee Spring area, is it not fair to state that you had not actually physically been down on the ground area of any portion of the Little Tennessee River?

A. No, sir.

Q. Pardon?

A. That's not fair to say.

Q. What is fair to state?

A. I have been on the ground area back in 1973 in the vicinity of, oh, maybe a dozen different places along the river.

Q. That was in connection with other matters [2–84] other than this matter dealing with the snail darter?

A. Yes. That was in connection with the fishes that supposedly lived in this area.

Q. What I am asking you, sir, though, in connection with any investigation you have made concerning the snail darter, prior to February 24, 1976, you had not been in the area of the Little Tennessee River and physically on the ground?

A. Or in the water.

Q. Or in the water.

A. That is right.

Q. And is it not also a fact from your direct testimony that you testified that on November 12, 1974, that was the first occasion that you had ever seen a specimen of a snail darter?

A. Yes, sir.

Q. On that date it was in Washington, D.C. and I believe Mr. Jack Chance of the TVA showed you a vial which contained a specimen of a snail darter?

A. Yes, sir.

Q. I believe it is also fair to say, is it not, that even as of today, through today, you have never actually physically examined and analyzed a specimen of a snail darter?

A. That's not true, sir.

Q. Is it not a fact that you have never actually [2–85] analyed and inspected it in terms of dissecting it?

A. I have inspected it and what you mean by analyzing, I, of course, do not know.

Q. Well, in terms of you as an ichthyologist and scientist, would you not agree in order to make a complete and thorough examination of a species, to determine all of its physical characteristics, not only gross physical characteristics but of its inner morphology that you would have to dissect the animal?

A. I never made any claim that I made this kind of an examination of the snail darter.

Q. So it is fair to say in that sense you have never analyzed a snail darter?

A. I have looked at snail darters, but I have not done what you call analyzed a snail darter.

Q. And when you say you have looked at it, really all you have done is made a gross visual observation of it?

A. That, and I have observed larval snail darters at——

Q. I am talking about the snail darter itself, Dr. Raney?

A. I am talking about the snail darter itself.

I have observed larval snail darters, at the Norris project. [2–86] I have seen two live snail darters. I have examined some preserved snail darters, but I have not tried to repeat the work that others have done.

Q. All right. Getting down to this specifically, the only time you have actually physically examined a specimen of the snail darter other than in the egg or larval form has been the time on November 12, 1974, when you looked at the specimen when it was in a glass vial; correct?

A. No, sir.

Q. First, that is the first occasion——

A. That is the first time but that is not the only time.

Q. I understand that, and that was when it was in a glass vial?

A. Yes, sir.

Q. All right. And you have never taken it out of the glass vial and actually handled it and physically handled it and examined it?

A. On the 12th of November I did not.

Q. And again on February 24, 1976, when you were in the area of the Coytee Springs, the only time you actually observed a specimen of the snail darter on that occasion is when one of the biologists handed you two plastic bags with water in them with a snail darter in each plastic bag?

[2—87] A. That's not correct, sir. It was a plastic bucket, not a plastic bag.

Q. Plastic bag, plastic bucket, it was a plastic container, all right?

A. That is all right with me. I just told you what it was.

Q. All right. But isn't it true and fair, Dr. Raney, that on those occasions you did not physically examine the snail darter; you merely looked at it through the container?

A. I touched one, I looked at them, I admired them. I noticed that they were of the opposite sex.

Q. Well, now, let's get down to that. You contend, Dr. Raney, that you are an expert ichthyologist, but yet is it not correct that on February 24, 1976, you had asked someone how to determine the males from the females?

A. No, sir, that is not true. I did ask someone else how he determined that they were male or female.

I had no doubt. The female was swollen with eggs and she was obviously a female.

Q. Is it not correct, Dr. Raney, that you as an expert ichthyologist, in your mind, on February 24, 1976, in order for you to tell the difference between a male and female you had to ask one of the TVA biologists?

A. I did not. As I just said, all I did was ask [2–88] him how he told because I wasn't certain that he knew how to tell the sex.

Q. You weren't certain that he knew?

A. I was not certain. I was certain that I knew how.

Q. Isn't it a fact that on your deposition you answered questions precisely to the contrary?

A. No, it is not precisely the contrary in my deposition.

Q. I will ask you then, Dr. Raney, if you did not give me the following answers to the following questions.

Question: "And are you not in some way relying on the study and data of Dr. Etnier in forming that conclusion?"

Answer: "Not particularly in that particular instance because these seiners, these biologists that were out there had been there a number of times, were familiar with the—they were actually attempting to study when this snail darter reproduces."

Question: "Well, they basically told you that one was male and one was female?"

Answer: "They also said that."

Question: "And you were really relying on them and not forming a basis for your own opinion?"

Answer: "Well, I asked the same questions that you did. I said, 'How do you tell?' and in the meantime, I found [2–89] out, here again from TVA biologists, that the female begins to mature eggs in the fall, so she has an extended abdomen."

Question: "So even as late as February 24, 1976, you would agree that you were somewhat a neophyte as far as snail darters, and really had to ask the sex of the snail darter specimens that you examined."

Answer: "I didn't ask the sex. I just said, 'How do you tell the sex?' "

A. That's precisely right, sir. I knew what the sex was. I asked one of the gentlemen there, "How do you tell the sex?"

Q. Isn't it a fair statement, Dr. Raney, that you did not know and you were asking these gentlemen?

A. I certainly did know and I could tell the sexes of any darter in Eastern North America at that stage in its spawning history. It was before spawning time.

Q. When does the snail darter spawn?

A. March and April.

Q. And you got that information from the TVA biologists, didn't you?

A. Mostly.

Q. And you also got it from Dr. Etnier's paper, did you not?

A. I have read Dr. Etnier's paper.

Q. And you would agree that the information that [2–90] you obtained in that regard was from someone else and not from your own investigation; isn't that correct, Dr. Raney?

A. I look at these two darters and it is obvious that one was the swollen female and——

Q. Dr. Raney——

The Court. Wait a minute, Doctor. Now, when you answer these questions you answer yes or no if you can. If you cannot, tell counsel, tell counsel, and then if you want to I will let you make a relevant explanation. But don't start on some long dissertation when you answer a question. Just, please, answer it yes or no, if you can.

Read the question to him.

[The question was read by the reporter.]

A. No, it is not correct.

The Court. Now, if you want to make a relevant explanation, you may.

A. The explanation, sir, is this.

The Court. If it is short, now.

A. Yes. I knew that one was a male and one was the female. I asked one of the chaps who was there, and I don't remember who it was, I said, "How do you tell?"

Mr. Dougherty. Your Honor, that was not the question I asked him.

The Court. Well, that is all right. Let's go [2–91] to another question.

Mr. Dougherty. He has not even answered the question.

The Court. I have heard all I want to hear on that.

Mr. Dougherty. The part that I was asking him, in terms of the information about when the snail darter spawned and reproduced, the information in that connection, aside from whether you told this fellow how to tell the sex, you got that information from the biologists and from Dr. Etnier's paper, didn't you?

A. And from my own observation, sir.

By Mr. Dougherty:

Q. When have you actually observed the spawning activities of the snail darter?

A. I didn't say that I had, but on the 24th of February I saw darters that were approaching the spawning condition.

Q. And as to when that darter would become mature as far as the spawning condition, you really couldn't tell yet?

A. It was mature.

Q. It was mature?

A. But it was not spawning.

[2–92] Q. How do you know it wasn't spawning?

A. There was no milt running from the male. It was obvious. There were no eggs in the bucket.

Q. Do you know when the male begins to mature?

A. Yes.

Q. When is that?

A. In the fall of the year.

Q. And when does the female begin to mature?

A. She begins to mature eggs in the fall and through the winter. In other words, the eggs begin to enlarge at that time.

Q. Again that information you obtained from the TVA biologists and from Dr. Etnier's documents?

A. And from general information about a hundred species of darters.

Q. Now, getting into that, Dr. Raney, isn't it a fair statement that in the scientific community, prior to ten years ago you were considered a recognized ichthyologist in the United States, but in all frankness you have not kept active in the last ten years and have not engaged in active field work yourself?

A. There isn't——

The COURT. Now, wait a minute. Yes or no, and then——

A. No.

[2-93] The COURT. All right, now.

A. That is not a fair statement.

The COURT. If you want to make a relevant explanation, you may.

A. The explanation is this, sir, that at the present time I have more than two hundred ichthyologists working for me and seldom in a two-day period or a two-week period passes that I am not in the field someplace, or that I am not examining specimens, or that I am not reading reports that these people have prepared.

I am not doing the same kind of work that I did before, but we are dealing with population of fishes, fish communities, ecological studies of fishes, behavior studies of fishes; we know the systematics of fishes where I work because we worked them out over a thirty-year period and we don't have to fumble around like others do in areas where they don't know what they are talking about.

Q. The question that I asked you, Dr. Raney, is it not a fact that in the last ten years you have engaged in very little actual field work yourself?

A. No, that is not; no.

Q. Is it not a fact that in practically all of the papers that you have been involved with in the last ten years most of the work for those papers have been done by other people other than yourself?

[2-94] A. No.

Q. You deny that?

A. That is not a fact.

Q. By the way, I believe you are a consultant under contract with the TVA?

A. Yes, sir.

Q. And have been for a number of years?

A. Yes, sir.

Q. And your pay is the basis of $200 per day whether it is an hour or whether it's the whole day?

A. Yes. The day usually runs to twelve hours, though, sir.

Q. You referred earlier to certain darters that live in reservoirs or are capable of living in reservoirs, but of the subgenus imostoma. Will you tell me what darters in that subgenus can live in reservoirs, and may I ask you, sir, what documentation you have in front of you and what you are referring to or reading from?

A. I am not reading from anything but I am referring to a bunch of scribbled notes that I make in order that I am able to recall dates accurately.

Of the five species of imostoma, I note that tanasi lives in reservoirs.

Q. I am asking you, sir, other than what you say tanasi does, what other so-called species of the subgenus [2-95] live in reservoirs?

A. The river darter, shumardi, also lives in reservoirs.

Q. Is it not a fact, sir, that Percina uranidea, which is the closest relative to the Percina tanasi or snail darter, does not live in reservoirs?

A. I don't know that is true. I know that it is reported from the White and Saline Rivers in Arkansas, formerly from the Wabash River in Indiana, but big rivers have been explored so poorly they don't think we are in a position to say that that species does not live in big rivers or in reservoirs.

Q. Dr. Raney, in terms of the scientific evidence today, isn't it a fair statement that Percina uranidea does not live in reservoirs but only in rivers and primarily in Arkansas and formerly in the Wabash River in Indiana?

A. Based on present observation, that is true.

Q. So you then would have to agree that the Percina uranidea, as far as the scientific evidence today, is not a reservoir fish?

A. No, sir, I don't have to agree to that.

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Q. What scientific evidence do you have to the contrary?

A. The scientific evidence that we have to the [2–96] contrary is better illustrated by the case at hand where supposedly——

Q. Dr. Raney, I am asking you——

A. [Continuing.] This so-called tanasi, the snail darter, only lives in the Little Tennessee——

Mr. DOUGHERTY. Your Honor, I am asking that he be responsive——

The COURT. I can't do anything.

A. [Continuing.] And we know that it does live in both——

By Mr. DOUGHERTY:

Q. Dr. Raney——

A. [Continuing.] In both Watts Bar and the Chickamauga River.

You asked me the question, sir, and I am merely trying to answer it.

Q. No, you are answering a different——

A. You are interrupting very rudely.

Q. Dr. Raney, may I ask you this question in all due courtesy, sir, what evidence do you have, putting the other fish in the subgenus imostoma aside, that Percina uranidea, the closest relative to the tanasi, lives in any body of water other than the White and Saline Rivers in Arkansas and formerly in the Wabash River in Indiana, what scientific evidence do you have? [2–97] A. I have none.

Q. Thank you.

A. I have already said that.

Q. What evidence do you have, for example, that the Percina Ouachitae, another close relative of tanasi, the snail darter, resides in any body of water other than rivers, putting aside rivers not being reservoir impoundments? What scientific evidence do you have, Dr. Raney?

A. I haven't investigated.

Q. So you really don't know?

A. I have not investigated it.

Q. And is it not really fair, in all honesty with the Court, that as far as the subgenus imostoma, of which the snail darter, Percina tanasi is a member, you really have not engaged in much scientific study concerning that subgenus?

A. That's true, sir.

Q. So you cannot really testify as an expert about the subgenus imostoma?

A. I have no intention to. I didn't come here for that purpose.

Q. That is fine; that's fine. And in connection with the Percina tanasi, or what we call the snail darter, the only basis which you have for you to say the snail darter can live in the upper reaches of the Little Tennessee River [2–98] between 411 Bridge and Chilhowee Dam, is that you think the substrate in that area is suitable for a snail darter to reside in?

A. In some parts.

Q. In some parts. You would agree that at the very least that there are certain parts of the substrate area, or bottom area between 411 Bridge and Chilhowee Dam that are not suitable at all for a snail darter habitat?

A. On the basis of our present information.

Q. And the information that you have in that connection has again been provided either by Dr. Etnier or by the TVA biologists?

A. It has been provided by TVA biologists.

Q. And in that connection, so that the Court understands your observations of this area, since you have been involved in the snail darter project, so to speak, on one occasion you took an overflight with a helicopter of the area of the Little Tennessee and the Watts Bar Reservoir; a fair statement?

A. No, sir.

Q. We will get into the other in a minute, but that's the occasion you took in the helicopter, did you not?

A. I wasn't over the area in a helicopter on more than one date.

Q. OK, a couple of days then in a helicopter.

[2–99] A. Well, it's more than one. I guess that would be a couple in your language.

Q. I would assume two is more than one.

Now, Dr. Raney, in that connection the only other occasion that you have actually physically observed the Little Tennessee River since you have been involved in the snail darter program is when one of the TVA biologists, specifically I believe Mr. Saylor and a couple of others, took you in an automobile and drove you on the roads that went up from the dam, where the dam is being built, to the Chilhowee Dam and, of course

you would acknowledge that on some of those roads you can't even see the river from the road.

A. What's the question?

Q. Would you not agree that on one other occasion when you say you observed the Little Tennessee River, on that occasion your observation was limited to viewing the Little Tennessee River from an automobile in traveling the distance by road and in some of those areas you cannot even see the river from the road; is that not a fair statement?

A. Yes.

Q. And the only other time that you have actually physically been on the ground in the Little Tennessee River was on February 24th, 1976, where the helicopter sits down and lets you out at Coytee Springs and you went down and looked at a couple of these samples, stayed a little time and [2–100] then left?

A. Yes, sir.

Q. And on no occasion have you actually been on the river above 411 Bridge and Chilhowee Dam and physically examined and looked at the substrate areas yourself?

A. No, except from a helicopter.

Q. And would you not agree that it is a little difficult from a helicopter to determine, for example, depth, to determine the precise nature of the bottom, to determine what food organisms are on the bottom, to determine the flow of the current and the velocity of the current, can you see that from a helicopter?

A. The answer to your multiple question is no in part.

Q. And would you not agree that the velocity of the current, for example, in the particular area would be an important determination as to whether or not this would be a factor included in the snail darter habitat?

A. It could be, sir.

Q. And yet you acknowledge that in these helicopter overflights it is difficult to determine the degree and velocity of the current?

A. Often it is not difficult.

Q. Often it is, isn't it?

A. Depends upon the depth of the water and the [2–101] turbidity of the water.

Q. And again, can you tell us looking from a helicopter above exactly how deep the water is in a particular area, particularly if you can't see the bottom?

A. If you can't see the bottom, you can't tell how deep it is.

Q. It is a little difficult.

A. Yes, it's a very wise observation on your part, sir.

Q. Now, isn't it a fact, Dr. Raney, that you have no scientific evidence thus far that the snail darter is in any way able to reproduce in the three locations in the Watts Bar Reservoir where the snail darter has been observed?

A. I would say yes.

Q. And would you not agree, Dr. Raney, that it would be an essential aspect in determining, for example, the critical habitat of the snail darter, that that snail darter be able effectively and successfully to reproduce in that specific area?

A. Yes, sir.

Q. So then you cannot really say, for example, in terms of your prediction, so to speak, from a scientific point of view that the snail darter can have as a part of its critical habitat that area in the Watts Bar Reservoir?

A. I am able to say that on the basis of a [2–102] number of specimens that have been seen or taken there.

There is a viable population there and it would not exist there if they could not reproduce. This is in direct evidence.

Q. As to how they got there you do not know?

A. Well, I have a theory on that.

Q. Would you not agree, for example, some of them at least in the area of the confluence of the Little Tennessee in the Watts Bar Reservoir probably got in that area by coming down through the Little Tennessee River?

A. A few of them might.

Q. And just because a fish is found in a specific area does not mean that that fish or species reproduces in that area?

A. Not necessarily but usually it does.

Q. And would you not agree that, for example, in the Little Tennessee River itself, and this has been confirmed by the TVA biologists and others, that the trout that are in that river live there but do not reproduce there?

A. I have made no study of the trout in the Little Tennessee River.

Q. You really have no evidence to indicate one way or other whether that is true?

A. I have made no study of the trout in the Little Tennessee River.

[2–103] Q. Then you don't know whether that is correct or not?

A. I have made no study of the trout in the Little Tennessee River.

Q. All right. Thank you.

And again, in terms of whether or not a transplant is successful it would be necessary to show and determine that reproduction in that transplant area had been successful and effective, would you not?

A. Over the long run, yes, sir.

Q. And would you not agree that at this point in time there is no definitive evidence that the snail darter has engaged in successful and effective reproduction in the transplant area in the Hiwassee River?

A. Yes, through the same kind of evidence you could use to show that it has not reproduced successfully in the Little Tennessee River.

Q. And would you—do you have any definitive evidence from your own study, yourself, sir.

A. About what, sir?

Q. About reproduction in the Hiwassee or the Little Tennessee River?

A. No, sir.

Q. All right.

Now, and in reality the so-called predictions of yours [2–104] about where the snail darter could be found, they were determined primarily by flying over with a helicopter?

A. They were determined by being over the area in a helicopter and making very careful observations of the shoal areas.

Q. And I believe one of your real major predictions is that the snail darter would be found between 411 Bridge and Chilhowee Dam, the upper seventeen miles of the Little Tennessee River?

A. I wouldn't call it a major prediction, but I am sure it does occur there and I predict it will be found there.

Q. You would agree that after considerable searching thus far there has been no snail darter found in that area at all?

A. I don't agree that there has been considerable searching done. There has been some superficial looking, but the investigations to date have been inadequate to determine that it is or is not present.

Q. Would you not consider it important for someone to determine that as a major part of your so-called hypothesis that someone search that area to see whether it is there?

A. When they get time to do it, and they will.

Q. And, of course, at this point in time with the [2–105] searching that has been done there has been no darters found in that area?

A. No darters found but a lot of darters found in that area.

Q. No snail darters?

A. Talking about snail darter. As far as I know, no one has found snail darters above the 411 Bridge.

Q. OK. So from a scientific point of view, Dr. Raney, other than your prediction or fear, you cannot really say, for example, that the snail darter would be able to live, survive and reproduce in that area above 411 Bridge?

A. I predict that they do.

Q. You predict, but where is your scientific evidence to support that?

A. The evidence is that there are areas where the bottom is suitable. The reason they haven't been found is that the area has not been adequately surveyed, and the reason it hasn't been adequately surveyed is that time has been limited and it was more important to this case to show that it occurs in Chickamauga and in Watts Bar Reservoir.

Q. Were you aware of the fact that the Little Tennessee River in this area they routinely poison in areas that would be totally suitable for the habitat of the snail darter, and that after these poisoning efforts they have not thus far found any snail darter specimens?

[2–106] A. Routinely?

Q. Yes, and that has been going on for several years?

A. I am not familiar with the fact that they have routinely poisoned in the area below Chilhowee Dam. I am familiar with the fact that on occasion in the past that area has been poisoned.

Q. Would you not agree, Dr. Raney, that with the closure of the Tellico Dam and the consequent creation of the Tellico Reservoir, that first of all that the creation of that reservoir will adversely affect the critical habitat of the snail darter in the Little Tennessee River?

A. Some of the population of the darter in the Little Tennessee River will be destroyed.

Q. And will be destroyed as a result of the impoundment of this reservoir?

A. Yes, sir.

Q. And so you would agree then that the creation of the reservoir would necessarily, to some extent at least, jeopardize the continued existence of a certain portion of the snail darter population?

A. Of a certain portion, yes.

Q. And I believe your estimate of the snail darter in the Little Tennessee River was to the effect that you felt it was at least ten thousand and probably [2–107] significantly larger numbers than ten thousand?

A. This is an off-the-cuff prediction I made in the deposition, but I also said that in order to make a serious prediction you would have to carry on a study, markedly capturing. Now, of course, it is on the threatened and endangered list. Nobody will ever be able to determine anything real about this species because you won't be able to carry on a study that would enable you to get this information.

Q. These studies, even in an endangered species situation, are carried on under permits from the Department of the Interior, are they not?

A. If you can get one.

Q. And TVA has been engaging in this effort along with Wayne Starnes under permit from the Department of the Interior?

A. Yes, and it has been a very great limitation as far as TVA people are concerned because they are greatly limited to the number of specimens that they are able to take.

Q. Wouldn't you agree it is a fair statement that with the Endangered Species Act and with the snail darter designated as an endangered species, that some caution should be taken as far as how these species are dealt with?

A. Caution but not prohibition. With ten thousand to fifty thousand specimens of these a reasonable number of them could be studied.

[2–108] Q. Do you know how many have been transplanted?

A. Yes, sir.

Q. How many?

A. 710 to the Hiwassee.

Q. And do you know that as of this date there have only been observations of a hundred, give or take a few number?

A. Where, sir?

Q. I am talking about in the transplant area of the Hiwassee River.

A. I would say that is a goodly number to have been seen.

Q. And since the transplant has been going on since June of 1975?

A. Going on?

Q. Yes, sir.

A. You mean continuing?

Q. Were you aware of the fact that the transplants, the first transplant was something in the neighborhood of 400 or 350 and took place in June 1975, and that this transplant effort and observation of it has been going on since June of 1975?

A. I accept that question as a general one and the answer is yes.

Q. Now, Dr. Royal D. Suttkus, who testified in [2–109] this case on behalf of the plaintiff——

Mr. WAGNER. Your Honor, we object to what someone else testified.

The COURT. I don't know what he is going to say, Counsel. I can't rule on your objection.

Mr. DOUGHERTY. Your Honor, I haven't said a word about what the witness was going to testify and I don't intend to.

The COURT. No.

By Mr. DOUGHERTY:

Q. Dr. Royal D. Suttkus, who testified on behalf of the plaintiff, is a former student of yours, is he not?

A. Yes.

Q. And he is a man approximately fifty-six years of age and is the curator of the Tulane University fish collection?

A. Yes, sir.

Q. And that fish collection is one of the three largest in the United States?

A. I am not aware that that is true, but I have no evidence to contradict this.

Q. And would you not agree that Dr. Suttkus, in the last twenty-five years, has probably been one of the most active individuals as an ichthyologist in the entire United States?

[2–110] A. No, sir, but he certainly has been in the Mid-South.

Q. In the Mid-South?

A. Yes, sir.

Q. OK. And would you not agree that Dr. Suttkus is a recognized authority in the field of darters?

A. Yes, sir.

Q. And would you not further agree, Dr. Raney, that at this point in time, considering the aspect of population and the number of species that have been counted and determined, the range of that species, that the Little Tennessee River at the very least from river mile .5 to river mile 17 is at the very least a significant or a major portion of the range of the snail darter?

A. It is a significant portion. Whether it is a major portion remains to be seen, because we as yet do not know the range of the snail darter and this is what is being determined at the present time by the intensive effort on the part of the TVA biologists.

Q. Is it not a fact that from the reports and information that have been given to you that in the Little Tennessee River probably several thousand specimens of the snail darter have been observed at one point or another or collected?

A. Give or take, I think that is reasonable.

[2–111] Q. Several thousand?

A. Seen——

Q. Seen or collected in the Little Tennessee River?

A. Yes, on a hearsay basis, yes.

Q. You are relying in your testimony——

The COURT. Don't go into—ask him the question. Don't tell him what he is relying on.

Go ahead, let's bring this to an end, soon.

Q. And in that connection, other than what has been observed in the Little Tennessee River, roughly several thousand specimens seen or collected, outside of the transplant area in the Hiwassee and the Little Tennessee there have only been approximately eight to ten specimens either seen or collected in other areas?

A. I believe that is correct.

Q. And is it not further correct that you suggested to the TVA biologists that they check a number of other rivers and water courses in the East Tennessee area for the snail darter?

A. As time becomes available. For the most part these studies to date have been superficial because these conditions have to be right.

The COURT. Doctor, we don't want to hear anything more about that.

The WITNESS. I am sorry, Your Honor.

Q. Now, I want to ask you this question, if I may, Dr. Raney, and I will conclude: You are familiar with the South Holston Reservoir in the East Tennessee area?

A. Familiar with it, sir? No.

Q. Well, are you not aware in terms of your studies and information transmitted in the scientific community, that in a number of situations where pre-impoundment studies have been undertaken that there have been darters found in the water area or river area prior to the impoundment and that following the impoundment they have been unable to find, that is, recognized people in the scientific community, they have been unable to find any of these darters in the reservoir after impoundment and they have essentially become extinct in those areas?

A. With the reservation that when you say "any of these darters," I can't say yes to that. But generally speaking, when there is an impoundment a certain species are lost.

Q. And that could also apply as far as the snail darter is concerned in the Little Tennessee River?

A. Not in my opinion.

The COURT. That is all, Doctor.

The WITNESS. Thank you, Your Honor.

[Witness excused.]

[2–115] • • • •

The COURT. The Court understands that.

DR. ALAN RANDALL, called as a witness by and on behalf of the plaintiff in rebuttal, after having been first duly sworn, was examined and testified as follows:

Mr. DOUGHERTY. Your Honor, to briefly state the biographical information concerning this witness—Dr. Randall, you have been sworn, have you not?

The WITNESS. Yes.

Mr. DOUGHERTY. Dr. Alan Randall, R-a-n-d-a-l-l, resides in Nicholasville, Kentucky, he is thirty-two years of age.

He received his B.S. degree and his M.S. degree, specifically his B.S. degree in 1965 and his M.S. degree in 1969, from the University of Sidney, Australia, in agricultural economics.

He received his Ph. D. in 1970 from Oregon State University in the field of natural resources economics.

He is the associate professor of agricultural [2–116] economics at the University of Kentucky since 1974. Prior to that he was assistant professor of agricultural economics at New Mexico State University from 1970 to 1974.

His responsibility are teaching courses in the area of natural resource economics at the graduate and undergraduate level, and involved in the research and director of graduate student research in natural resources economics.

He has authored more than forty articles in professional papers in the area of agricultural economics, and in 1975 from the American Agricultural Economics Association he received the award for the outstanding journal article.

He has developed and tested a new technique for economic evaluation of environmental amenities which is now being widely used by his associates in the field of economics in the United States.

He is also under contract to write a textbook in the area of natural resource economics; he has been involved in numerous occasions in dealing with consultations in environmental and natural resource matters.

He has on several occasions consulted for contractors hired by the Corps of Engineers and the [2–117] National Park Services in the assessment of economic aspects of projects.

DIRECT EXAMINATION

By Mr. DOUGHERTY:

Q. You are that same Dr. Randall, are you not, sir?

A. Yes, I am. May I make——

The COURT. Do you know yourself after all that? [Laughter.]

The WITNESS. I don't recognize myself anymore.

A. [Continuing.] May I make one comment, I am here today in no way representing the University of Kentucky.

Q. You are here representing yourself and any opinion you express are personal opinions and not on behalf of the University of Kentucky?

A. Yes, sir.

Q. At our request and after being furnished certain documentations which were testified about by Mr. Kimmons, I believe you were present during Mr. Kimmons' testimony in the courtroom, have you examined certain economic documents concerning the amount of money spent on the Tellico project to date, as of March 31, 1976, and the so-called percentage of completion of the project to date?

A. Yes, I have.

[2–118] Q. And have you also seen and examined that documentation which is also in evidence to Mr. Kimmons dealing with the breakdown of the expenditures in the area on the March 31, 1976, documentation with regard to reservoir adjustments, clearing and rim treatment, construction supervision and services, general engineering design, and general administration?

A. Yes, sir, I have.

Q. And have you made an analysis with regard to those expenditures made by TVA which would be recoverable and nonrecoverable in the event the dam project were stopped as of today?

A. Yes, within the limitations imposed by the quality of the information available.

Q. In that connection, Dr. Randall, would you please in terms of the economic community give us a very brief definition of what we are talking about in terms of recoverable and non-recoverable?

A. Let me define what would be a non-recoverable expenditure in the context of this particular project.

Given the public functions of TVA and given the public nature of many of the purposes and benefits of this particular project, a non-recoverable expenditure would be an expenditure which could serve no useful public purpose other than a purpose associated with the impoundment of water in this [2–119] reservoir.

Q. And in that sense how would you define a recoverable expenditure?

A. A recoverable expenditure would be an expenditure which could yield public benefits in some alternative use to the impoundment.

Q. And have you also in connection with examining this matter not only looked at the cost and expenditure data which

has been furnished by the defendant TVA but also looked at the documentation dealing with the roads and highways and bridges in the area?

A. Yes, I have.

Q. And I show you a document which is a map of the Tellico Reservoir highway and railroad adjustments and ask you if this is not the document which you examined in connection with making your calculations and analyses?

A. It is.

Mr. DOUGHERTY. Will you introduce this as Exhibit No. 115.

The COURT. Received.

[Exhibit No. 115 was filed.]

By Mr. DOUGHERTY:

Q. Dr. Randall, to make this short and to the point, would you please indicate to the Court your analysis and your opinion of what are the recoverable expenditures [2–120] which could be derived in connection with this Tellico project.

A. OK. Referring to the document entitled Tellico Project Construction Status and Funds Obligations through March 31, 1976, dated April 27, 1976, which lists a number of classifications of expenditures, first the land acquisition, since it is land acquired could conceivably be put to alternative uses. That is not, for the most part that is not a non-recoverable expenditure, and that is noted here on the document that it is not.

Q. TVA has already acknowledged that?

A. That has been noted.

Q. Now going further.

A. The next item of interest is out of reservoir adjustments, clearing and rim treatment. This includes——

Q. Which is the third category of the March 31, 1976——

A. Yes, the next item of interest. This includes—OK, very substantial expenditures. Roughly, $17 million on roads and highways, bridges, et cetera; roughtly, $3.6 million on relocation of railroad and railroad bridges; a smaller sum on relocating other structures and improvements, and a small sum again on the clearing and rim treatment, et cetera.

Now the majority of these expenditures, the sum total [2–121] of the total expenditure of around $23 million, the majority of these expenditures are not non-recoverable because

in most of these cases expenditures go toward providing things which are of use even if the reservoir is not filled.

The road and bridge expenditures involve upgrading of roads and highways. As of any given date, say, for example today, the expected life of the new structure is substantially longer than any expected life of the replaced structure would have, so these have useful purposes into the future.

Many of the roads have substantially potential into the future and serving upgraded transportation links with the new Foothills Parkway, with a little additional expenditure, perhaps, on out to the west to link up with I–75, et cetera, et cetera.

Most of these things, I would say, if I am permitted and educated guess, I would say roughly 75 to 80 percent or more of the total reservoir adjustments represent expenditures from which the public can gain benefit and therefore they are not non-recoverable.

The COURT. Do you have an opinion as to what amount would be the recovery of that $23 million in round figures?

The WITNESS. If I was to have an opinion it would be in the order of perhaps, say, sixteen to nineteen million dollars, would probably be recoverable.

[2–122] By Mr. DOUGHERTY:

Q. Sixteen to nineteen million dollars of the $23 million?

A. Yes, I think so.

Q. Would be recoverable.

A. Yes.

Q. All right. Now, have you made any analysis with any further categories contained in those documents of March 31, 1976?

A. OK. I would say the majority at least of construction plant, equipment and inventories would be recoverable.

Q. Why do you say that?

A. Presumably these inventories by definition are things which have not been put into place and could be sold off or put to other use, if they were not used in this project.

The COURT. What is that figure? I don't have it.

The WITNESS. It's a small figure.

Mr. DOUGHERTY. The total figure on the chart, Your Honor, is $10 million.

The WITNESS. No, we are talking about construction plant, equipment and inventory, this is only $339,000.

[2–123] The COURT. How much?

Mr. DOUGHERTY. Three hundred thirty-nine thousand dollars.

The WITNESS. A small sum.

A. [Continuing.] The next item, construction supervision and services, general engineering and design, and general administration. There I would say at the very least that proportion of that expenditures which were associated with the activities, the other expenditures which are themselves—let's start again.

The proportion of these expenditures which is associated with the activities which are recoverable are themselves recoverable.

The COURT. What is that figure, I don't have it.

The WITNESS. The figure is $10 million.

Q. In your opinion, what amount would be recoverable of the $10 million?

A. I would say at least one-half and further study may indicate more than that.

Q. Now looking at the, as of this date, according to the document date, March 31, 1976, TVA has expended $78,619,000; is that not correct?

A. That is what it says here.

Q. Based upon your analysis and your [2–124] consideration of the Tellico project and what is recoverable and non-recoverable, what in your opinion as an economist is the amount that would be recoverable from the Tellico project from the $78 million figure, the total figure?

A. May I make some explanatory statement first?

Q. Yes.

A. Obviously, my study has been limited to the information——

Q. Provided by TVA?

A. Available to me. I suspect an in-depth study may reveal, have some more rather than less expenditures in the recoverable category.

But from the information that I see here, I would estimate that non-recoverable obligations would be of the order of $30 million, say plus or minus $5 million, to give me a little leeway here.

The COURT. Out of the $17 million how much would the TVA lose?.

Mr. DOUGHERTY. Out of $78 million.

The COURT. $78 million.

The WITNESS. I am not sure that's the question. I think the question is what is the public going to lose.

The COURT. You are not ruling on the legal questions, my friend. I want to know what the TVA [2–125] would lose, if anything.

The WITNESS. I am not competent to answer that.

By Mr. DOUGHERTY:

Q. But in terms of the non-recoverable expenditures that TVA has expended on this project which would not benefit the public or TVA, your figure is $30 million?

A. Yes.

Q. Out of the $78 million?

A. A margin there.

Q. In essence, you are saying that $48 million of the $78 million would be recoverable?

A. I think so.

Q. And in that connection as of this date in time, the information is that TVA still has $23 million to spend on the project, according to Mr. Kimmons' testimony?

A. Yes, right.

Mr. DOUGHERTY. That is all, Your Honor, I have.

Just one moment, Your Honor.

By Mr. DOUGHERTY:

Q. When you were talking about recoverable versus non-recoverable, you do contend you are competent to testify in the area of whats recoverable and non-recoverable, do you not? [2–126] A. Yes, I do.

Mr. DOUGHERTY. All right.

The COURT. Did you say how much is recoverable?

The WITNESS. What I said was, that the non-recoverable obligations would be of the order of $30 million, which would mean that, I guess, $48 million, roughly, is probably recoverable. In other words, can be put to some useful alternative use.

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CROSS EXAMINATION

By Mr. WAGNER.

Q. In other words, your testimony is that of the $78 million that was spent as of March 31, 1976, that $30 million of those public funds would be non-recoverable; is that correct?

A. Roughly, yes.

Q. Now then, the main area that your testimony differ with Mr. Kimmons' deposition, you did hear his testimony, did you?

A. I did.

Q. Is with regard to the reservoir adjustment, clearing, and rim treatment?

A. Yes.

Q. Which has $23,430,000, and the construction supervision and services, general engineering and design, and [2–127] general administration, which is $10 million plus?

A. Yes.

Q. The other items you just virtually agree with him on?

A. Well, I am not prepared to debate, really.

Q. All right.

Now then, have you or did you examine the road system that was modified by the TVA construction program?

A. I visited——

Q. Prior to any construction work?

A. You mean, back several years ago you mean; no, sir.

Q. All right. There is a three county area there in effect, Monroe County, Loudon County and Blount County, and there have been various roads relocated and redone in that area as a result of the project, and prior to any of that relocation or construction work did you examine those roads?

A. I did not visit the area prior to that work.

Q. When is the first time that you did visit the area?

A. Approximately March 29th.

Q. March 29, 1976?

A. Yes, sir.

Q. So you didn't see any of the roads before [2–128] that?

A. Before that time, no.

Q. Right. So you don't know whether or not the highway system and the road system was perfectly adequate without TVA's construction activities or not, do you?

A. Even if I had seen I would not have been qualified to comment on the engineering adequacy in that sense, no.

Q. Are you aware that TVA's construction activities and the road activities with regard to that three-county area was a designed road system to accommodate traffic as a result of the increased population and traffic as a result of the reservoir?

A. I have heard that.

Q. Pardon?

A. I have heard that.

Q. Were you also aware that a good part of the construction program was to relocate existing roads that would be covered up by the reservoir?

A. I am aware of that.

Q. So many of the roads that have been built have been to replace roads that would be 100 percent adequate but for the reservoir; is that correct?

A. I do not think so. I have examined the map and considered the matter of where, taken it road by road [2–129] and considered the matter of where the road starts, where it finishes, where it is going to go, et cetera, et cetera, and it is clear that many of these roads represent upgrading and improvement, longer potential life, and the ability to carry heavy traffic patterns which are likely to develop as a result of the Foothills Parkway and present a potential to the recreational use of the upper portion of the river that we are discussing in this case, et cetera, et cetera.

Q. Let me ask you a specific question: If you have point A and point B and you have a straight road between those two points that is perfectly adequate to carry the traffic, and as a result of a reservoir you build a road from those two same points that since that will be inundated you go a circuitous route and come around and come to the same point because of the reservoir. Isn't it a fact that the great deal of that is totally lost as far as benefit to the public?

A. Okay, I will put it as precisely as I can.

If the two roads that you speak of serve exactly the same function, if both roads are in the same condition, the same life expectancy, serviceable life expectancy, the same maintenance costs, et cetera, is in that case then, for example, one road would not be better able to handle, for example, future traffic

patterns, et cetera, in that case there would be a duplication, yes.

[2–130] Q. Okay.

Now then, were you aware that a lot of the construction work there as far as roads are concerned are intended and do in fact give access to property where the access will be inundated as a result of the project; do you know that?

A. No, I didn't.

Q. And wouldn't that be totally wasted, which the property already has access and if the reservoir does not come in, then additional access or just putting a new road in would be totally meaningless, wouldn't it?

A. If you are speaking of roads which simply give access, for instance, to a few houses or something, this would be the case.

Q. And aren't there a substantial number—go ahead.

A. OK. If a road, for instance, gives access to a certain number of people who live in an area with no expectation of population increase or anything else, then it has to be replaced as a result of inundation, that's a duplication of effort.

On the other hand, if some of these roads, for example, give access, either in their present condition on account of the work you have done to areas that may be appropriated for public recreational use, or with small expenditures in the absence of the dam by taking the road on [2–131] down into the river or to sites of interest, these kind of expenditures would represent additional public benefits in that case.

Q. Have you taken into consideration in arriving at your figures the additional costs that have been expended only because of the reservoir? I mean, you have a circuitous route or you have a bridge maybe twice as high, have you taken that into consideration?

A. The best I could.

Q. As best you could, but you recognize without having access to the transportation system then in advance of construction, that your figures are certainly subject to a lot of error?

A. I specified on the approximate margin of error.

Q. Now then, do you know about the growth—I think your figures have taken into account growth potential in the Monroe County area and in the Blount County area and the Loudon County area; has it not?

A. Yes. The expectation of future beneficial, we take that into account.

Q. Are you aware of how much Monroe County either grew or declined as a result of the last census?

A. I have seen the figure but I have forgotten it.

[2–132] Q. Did you take into account the fact that it is a declining population rather than a growing population, or do you know?

A. I was not so concerned about growth of population of the county as much as the potential growth of traffic through the county, and I think there is that with the Foothills Parkway, et cetera, with a potential recreational use of the river in the absence of this project, et cetera.

Q. But you don't know whether or not the transportation system was adequate or not prior to the construction program of the TVA?

A. I know that it has been improved and the improvement was useful.

Q. All right. In connection with the construction supervision and services, general engineering and design, and general administration, you say that you allocated that to various parts of the previous figures. Which figures did you allocate that to? How much did you allocate to land acquisition, specifically?

A. No, I did not, I did not go into that degree of depth. It made sense to me that if much of the expenditure of a specific item was recoverable, then probably a similar proportion of the general administration, overhead, so forth, would be recoverable too, and this is the necessary overhead [2–133] to do these useful things.

Q. So it is my understanding then that if you say 50 percent of that would be recoverable, then you would think that 50 percent of the cost of the project would be recoverable to the public, using that same reasoning?

A. Yes. I think we said a little more than 50 percent, probably be a little more than 50 percent.

Q. You said 50 percent, didn't you?

A. Yes, roughly.

Q. So using that same reasoning you would think 50 percent of the cost of the project would be recovered?

A. We said a little more, yes.

Q. So if there is $82 million expended at the present time, then you think that somewhere in the neighborhood of $40 million would be recoverable?

A. I think we are playing games with arithmetic, really.

Q. I am just asking you, using your same figures and using exactly what you just said, isn't that what you come up with?

A. Let me see. If you want to really get into the details, the construction supervision and services, and stuff, comes in two categories.

Q. I am asking you to answer my questions, using the figures——

[2–134] The COURT. Let him answer the question if he can and then, Doctor, if you want to make a relevant explanation you may. If you can't, tell him you can't.

The WITNESS. OK.

A. My figure of 50 percent was a very round figure given quickly to save the Court's time. If we wanted to do this, I would be willing to go into a little more detail to a subdivision of these expenditures.

I don't really think the difference between whether it is roughly 50 percent or roughly 60 percent is terribly critical.

Q. You mean, Doctor, the difference of $10 million isn't important to you?

A. 50 percent of $10 million versus 60 percent of $10 million is $1 million which falls within the margin of error I gave myself.

Q. We are talking about the difference between 50 percent of $80 million or 60 percent——

A. Of $10 million. We are talking about the construction supervision and services, general engineering and design, and the writing here is unclear, but I think it is general administration.

Q. All right. In connection with this first figure, the reservoir adjustments, clearing, and rim treatment——

[2–135] The COURT. About how much longer?

Mr. WAGNER. Another five minutes.

The COURT. The reason I ask, Judge Morton is going to speak over here at the Law Day Program and I think I have to recess now until, say, until 1:30.

Mr. WAGNER. Be fine, Your Honor. Thank you.

The COURT. Recess court until 1:30.

[At 11:55 a.m., court recessed until 1:30 p.m.]

AFTERNOON SESSION

[At 1:34 p.m., court reconvened pursuant to the noon recess, when the following proceedings were had.]

The COURT. All right.

Dr. Alan Randall, a witness on behalf of the plaintiff in rebuttal, resumed the stand, was further examined and testified as follows:

CROSS EXAMINATION—CONTINUED

By Mr. WAGNER.

Q. Doctor, you testified earlier that the first time that you had been up at Tellico project area was in March 1976; is that correct?

A. That is correct.

[2–136] Q. How many total times have you been to the Tellico project?

A. One.

Q. Just the one time?

A. That's right.

Q. Could you please, I have brought a red pencil here, could you take this map that you have examined and with red pencil put the route that you took and where you went while you were at the project site?

A. Perhaps I could. I was at——

Mr. DOUGHERTY. May I approach the witness?

The COURT. Yes, sir.

A. [Continuing.] I don't know whether I can get this exact for sure or not.

Q. Can we show him where Maryville is?

A. Could we—I came in here, I think, didn't we. I am not quite sure on that. I can tell you some places I have been rather than I can find the exact route we took.

The COURT. He wants to know where Maryville is on the map.

Mr. WAGNER. Maryville would be down here.

The COURT. Maryville would be east of it.

A. We did find, I know we found our way up along, whether this is the road or whether it is an old road, the one or the other, up along here to a point about here, somewhere, [2–137] and then came back around some small roads to around here, and then——

Q. If you would make a red mark.

A. All right. I will do the best I can.

[Witness marks on map.]

This section of road in here. Somewhere around here, anyway. Whether that is the exact road or not, I can't be sure.

Up to a point around here, somewhere, and back here. Then I think perhaps around here and perhaps back out.

Then, we came into three or four different places, near this island one time, I remember that, and I think it might be along here.

It is hard to tell on that map exactly.

Q. Did you go through the project area or around to it?

A. We went around and came in at a couple of points. We went back out and around.

Q. So your marks in red indicate where you have actually been in the project area?

A. Yes, I guess so. There are some other places if I could find them here.

I can't find Coytee Springs. It's around here somewhere.

Anyway, we made it from here to here, approached the [2–138] river at about three different places. I can't pick them out exactly.

That's about as good as I could do.

Q. And those are the only places you have been to in the project area?

A. Yes, it is. Yes, it is, to the best of——

Q. OK, Doctor.

Dr. Randall, do you know how many miles of road there were in the project area before TVA began construction work?

A. No, I do not.

Q. So, of course, you don't know how many of those were paved or how many were gravel or how many were tertiary, secondary, so forth, anything of that nature?

A. No, except for the information that can be gleaned off of any map and off the list of roads in the project.

Q. So you did not use that information then in developing your figures; you didn't have it?

A. Not the total number of miles, no, sir.

Q. Do you know how many miles have been completely relocated as a result of the project; how many miles of roads?

A. The number of miles, no.

Q. You don't know that?

A. You can get a pic[illegible]e of what has been [2–139] relocated from the map an[illegible] have not done that.

Q. Do you know how [illegible]ny miles of road have been built to date?

A. No, sir.

Q. Then you don't know how many of those are paved and how many are gravel?

A. I guess in miles, no.

Q. You don't know how many are tertiary? Do you know what I mean by tertiary roads?

A. I do, and I don't know how many miles. I can identify the tertiary roads from the map.

Q. Do you know how many people presently live in the project area?

A. Precisely, no.

Q. Do you know a general figure?

A. How are we going to define the project area?

Q. The 38,000 miles—I mean the 38,000 acres that TVA has acquired.

A. I don't know that figure, no.

Q. You have no idea?

A. Roughly an idea.

Q. How many?

A. Something of the order of two to three hundred households, roughly.

Q. At the present time?

[2–14*o*] A. No. Many of these have been moved; many of these have been moved now.

Q. That is what I am asking, how many at the present time are living there?

A. I don't know.

Q. You have no idea?

A. I do not know.

Q. All right.

Have you performed any type of economic analysis of the economic conditions prevailing in the project area at the present time?

A. I have not performed such analysis.

Q. Do you have any idea of what type economic conditions will be or have you performed a study of the economic conditions that will be prevailing in the project area without the Tellico project?

A. No, I have not performed a study.

Q. OK.

Doctor, I think Mr. Pedersen contacted you a couple of days ago before you came down?

A. That is correct.

Q. And talked to you on the telephone?

A. That is correct.

Q. And at that time you were prepared to testify; you said you were going to testify in the case?

[2–141] A. If asked.

Q. And you gave him the general areas that you were going to testify in?

A. That is correct.

Q. And at that time you didn't have any TVA figures, did you?

A. No. I had, let's be precise, I had the documents entitled "Tellico Project Construction Status and Funds," I think through February 29, or something like that.

I had that figure. What I did not have and something I thought important was the handwritten breakdown which I now have that runs about four pages. You know what I mean, dated April 27, but that is the information which is new.

Q. When was that information furnished to you, Doctor?

A. Wednesday evening.

Q. Wednesday evening, at what time?

A. Roughly of the order of about 5:30.

Q. How much time did you spend in preparing your assessment and your analysis upon which you are basing your testimony this morning, this afternoon?

A. Perhaps four or five hours.

Q. Four or five hours?

A. Yes.

Q. Doctor, isn't it fair to say that this is the [2–142] type of study people spend literally months in performing to come up with good figures?

A. I would recommend that procedure. I highly recommend that.

Q. In other words, Doctor, would it be fair to say that your testimony this morning is strictly a ballpark figure?

A. Yes. I think I have said that already.

The COURT. I dont know what a ballpark figure is.

Mr. WAGNER. It's highly speculative as to precisely the correct figure.

The WITNESS. I would call it imprecise. I don't think it's highly speculative at all.

I think that a careful analysis would come out with a figure within the range that I suggested. But it is imprecise, and I agree to that.

Mr. WAGNER. All right.

By Mr. WAGNER:

Q. And wouldn't it be fair to say that Mr. Kimmons' figures, a person that is very closely involved in the construction, that has been in charge of the engineering design and the construction activities on the project, that his figures would probably be closer and more precise than yours?

[2–143] A. The answer is no, and may I explain.

I think his figures are probably very precise as to the total expenditures. On the other hand, I suspect that he has not made a careful analysis of what amount of those expenditures are likely to be non-recoverable and what would not be non-recoverable.

Q. Yet you don't know what roads were present there before they were built, how many miles there were?

A. Not in terms of miles. I do have information that can be gleaned from that map and have taken some notice of that and derived a ballpark figure, as you say.

Q. You did that in four hours?

The COURT. He said that, Counsel. Let's not repeat.

A. This is four hours, four hours since the handwritten sheet of four or five sheets of information dated April 27 were provided me.

Q. Now then, with regard to th[illegible]——

A. Perhaps I should continue [illegible]t answer. I have had all of the information which the counsel for plaintiff were able to get hold of on these matters for a period of about six to eight weeks. So it is not all done in four hours now.

Q. Doctor, I think the figures that you were quoting from a moment ago, let's talk about the railroad [2–144] bridge.

A. Yes.

Q. That $3,604,000 have been expended in connection with.

A. Yes.

Q. How much of that goes to the public benefit?

A. I would say most of it.

Q. It goes to the public benefit for a railroad bridge, that will be used only for the railroad?

A. Yes, I think railroads are useful things.

Q. Now my question is though, TVA is a public agency to benefit the public and it has statutory purposes, and so forth. You are saying that that inures to the benefit of the public in this area?

A. OK, let me be perfectly clear. It inures to the benefit of the public in general terms and I have already stated I am not competent to testify as to TVA's internal auditing and accounting.

Q. Doctor, it would be fair to say that that $3.6 million inures to the benefit of the railroad without the project; is that correct?

A. Yes, and the railroad is a beneficial activity and therefore it inures to the benefit of the public in the end.

Q. So in making your assessment then you counted [2–145] almost the full $3.6 million for that to be for the public benefit?

A. Yes, fair amount proportion of it anyway. The grounds for that were that the newer railroad bridge has a much longer life expectancy than the old one in terms of usable serviceable life.

Q. What about the relocation of the power lines, Doctor, does that inure to the public's benefit?

A. I would say to perhaps a small extent, probably not to a major extent.

Q. Very small extent?

A. I suspect.

Q. What about the relocation of gas lines, does that inure to the public's benefit?

A. Again, the public, to a small extent. I would have to know, roughly, what the serviceable life expectancy that is being re-

placed, structures, but I did not weigh this heavily in the calculation.

Q. What about the 411 Bridge, how much of that did you attribute to the public benefit?

A. With the benefit of Mr. Kimmons' testimony I would say in general the bridge clearly is a beneficial thing. It replaced a smaller bridge. It is a beneficial thing. I have accepted it on face value of Mr. Kimmons' testimony that the bridge was made more expensive because it [2–146] was higher and the approaches longer. So I would say maybe half of that expenditure would be to the public benefit.

Q. You don't know, you are not an engineer, are you?

A. No.

Q. And you don't know about the cost of construction of roads?

A. No, I do not.

Q. Do you have any idea about the need for roads, in that area before the TVA project?

A. Before the project or in the future without the project, we ought to make that distinction?

Q. I think before the project.

A. No, in that case, no, I did not know.

Mr. WAGNER. OK. That is all.

Mr. DOUGHERTY. Very brief question, Your Honor.

REDIRECT EXAMINATION

By Mr. DOUGHERTY.

Q. In making the necessary economic calculations that you have made and providing the Court with calculations that have some substance, is it really essential to know how many miles of road there are after having viewed the map in front of you?

A. For a very precise analysis, it would be very [2–147] nice to know that, but for the kind of analysis I have made I don't think it's necessary.

Q. Even though you say yours is a ballpark figure, you feel like it has precision within certain limitations?

A. Yes, sir.

Q. Now, Mr. Wagner was asking you about the design of roads and bridges and what-have-you. Will you state whether or not the design is the key criteria or whether or not as far as a benefit to the public these items have alternative use or uses for the public?

A. I would say the key criteria is whether they have alternative uses. On the other hand, I would say that if the specific purpose of impoundment necessitated a different, more expensive design that excess expense would probably not have public use in the absence of the impoundment.

Q. And you have given certain consideration or deducted figures or allocations in your calculations that you provided for the Court?

A. Yes.

Q. And in general terms the amount you consider non-recoverable is $30 million?

A. Yes, right.

Q. And the $48 million of the $78 would be recoverable as a benefit to the public?

A. Within that margin, yes.

[2–148] Q. And that according to the record TVA still has $23 million to spend as of this date?

A. Yes.

Mr. DOUGHERTY. That is all I have, Your Honor.

The COURT. That is all.

[Witness excused.]

The COURT. Anything further for the plaintiff?

Mr. DOUGHERTY. The plaintiff has nothing further, Your Honor.

The COURT. Anything further for the defendant?

Mr. WAGNER. Nothing further from the defendant, Your Honor.

The COURT. Do you gentlemen want to argue the case?

[Counsel for the respective parties presented oral argument to the Court, at the conclusion of which the Court took the case under advisement.]

This is all of the evidence introduced during the trial of this cause.

[40 Fed. Reg. 47505–06]

[EXHIBIT 4]

Title 50—Wildlife and Fisheries

CHAPTER I—UNITED STATES FISH AND WILDLIFE SERVICE, DEPARTMENT OF THE INTERIOR

SUBCHAPTER B—TAKING, POSSESSION, TRANSPORTATION, SALE, PURCHASE, BARTER, EXPORTATION, AND IMPORTATION OF WILDLIFE

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

Amendment Listing the Snail Darter as an Endangered Species

Background. On January 20, 1975, Joseph P. Congleton, Zygmunt J. B. Plater, and Hiram G. Hill, Jr., petitioned the Department of the Interior to list the snail darter (*Percina* (*Imostoma*) sp.) from the Little Tennessee River, as an endangered species according to the expedited emergency procedures of section 4(f)(2)(B)(ii) of the Endangered Species Act of 1973. This petition, and accompanying supportive data, were examined by the Fish and Wildlife Service which determined that sufficient evidence existed to warrant a review of the status of these species. A notice to that effect was placed in the FEDERAL REGISTER on March 10, 1975 (40 FR 11618). Simultaneously, the Governor of Tennessee was notified of the review, and was requested to supply data on the status of the species in his State.

As a result of this review, the Director of the Fish and Wildlife Service found that there are sufficient data to warrant a proposed rulemaking that the snail darter be listed as an endangered species. This proposed rule-

making was published in the FEDERAL REGISTER on June 17, 1975 (40 FR 25597). Interested persons were invited to submit written comments on the proposal to the Director no later than August 18, 1975.

Summary of Comments. Sixteen comments were received. Portions relevant to the biological status of the snail darter are summarized as follows:

(1) Twelve persons completely supported the proposed rulemaking. These included several ichthyologists and biology professors who felt it was a valid species and did need protection. Also among these were several concerned citizens decrying the possible destruction of the species which is threatened by the Tellico Dam.

(2) There were three letters opposing the listing of the snail darter as "endangered," none of which was relevant to the biological evaluation.

(3) A letter and attached appendices were received from the Tennessee Valley Authority, the agency sponsoring the construction of Tellico Dam. The Tennessee Valley Authority is opposed to listing the snail darter as an Endangered species. Quoted below are the specific objections raised by TVA in their extensive comments and appendices:

"1. Listing of this fish would have no valid basis since the taxonomic status of the fish has not been determined, there is no known publication of its description, and it has never been classified as a new and distinct species.

"2. Clearly, no present threat exists to the snail darter which would justify shortcutting the customary scientific procedures. There has been no systematic or adequate study of the range of this fish. There is, however, scientific opinion that the fish undoubtedly exists elsewhere in the Tennessee River system, unaffected by the Tellico project. In light of this, the statement in the notice that impoundment of Tellico "would result in total destruction of the snail darter's habitat," is in error.

"3. Listing the snail darter would not enhance the likelihood that this fish would survive and therefore would not further the purposes of the Endangered Species Act. As a part of the Tellico project, TVA and

others already are undertaking a scientifically recognized program to conserve the snail darter.

"4. For the foregoing reasons, it is clear that the Endangered Species Act does not require, nor indeed does it even permit, the Secretary's proposed listing. In light of this we do not believe that the Fish and Wildlife Service should inject itself into the long-standing controversy surrounding the wisdom of the Tellico project. Tellico is a lawfully authorized federal project which has been under construction since March 1967. It has been repeatedly funded by Congress, over objections of opponents, and impoundment is presently scheduled for January 1977. Its environmental consequences, including specifically its effect on undescribed species of darters which were thought to be rare and endangered, were fully described and considered in TVA's Environmental Impact Statement for the project. The sufficiency of that statement and the reasonableness of the TVA Board's decision to proceed after enactment of the National Environmental Policy Act has been litigated and upheld by both the United States District Court for the Eastern District of Tennessee and the Sixth Circuit Court of Appeals. Subsequent to such litigation, Congress, with full knowledge of the project's environmental impacts, has continued to appropriate money for completion. In light of this exhaustive review of the project, including specifically a consideration of its effect on possibly rare and endangered species of fish, no worthwhile purpose could possibly be served by listing the snail darter as 'endangered' solely because 'The proposed impoundment of water behind the proposed Tellico Dam would result in total destruction of the snail darter's habitat,' as stated in your notice. We believe the likely result would be more time-consuming and meritless litigation.

"In summary, TVA believes that there is no scientific basis to support listing the snail darter, there is no environmental need for such action, and that nothing positive would be accomplished."

The Director has considered the above comments as well as the appendices accompanying such comments.

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The Director has also considered other information obtained by the Fish and Wildlife Service subsequent to the proposed rulemaking. The following response to the Tennessee Valley Authority's comments is based on all information available at this time.

1. The original data submitted in the petition to list the snail darter as an endangered species could reasonably be read to suggest that the snail darter was a distinct species in danger of extinction throughout its range. Comments received on the FEDERAL REGISTER notice of March 12, 1975, to review the status of the species, in no way suggested otherwise and provided additional evidence to warrant a proposed rulemaking. Subsequent to the proposed rulemaking, we received additional data in the form of an unpublished manuscript, in which the species was described, further substantiating the validity of the snail darter as a distinct species. The manuscript has been reviewed and accepted by a panel of ichthyologists at the Smithsonian Institution, and approved by them for publication in the *Proceedings of the Biological Society in Washington*. The expected publication date of the description of the snail darter is December 1975, or January 1976.

The Fish and Wildlife Service is proceeding with the formal listing of the snail darter, *Percina* (*Imostoma*) sp., as an endangered species because biological evidence indicates that it is a valid species in danger of extinction. The Service acknowledges the lack of a published formal description of the snail darter with the designation of a name-bearing holotype at this time. The Service also recognizes the fact that the snail darter is a living entity which is genetically distinct and reproductively isolated from other fishes. Section 3(11) of that Act states that "the term 'species' includes any subspecies of fish or wildlife or plants and any other group of fish or wildlife of the same species or smaller taxa in common spatial arrangement that interbreed when mature". The weight of scientific opinion recognizes the snail darter as a distinct species. To delay its listing as endangered until the formalities of a species description and its publication are completed would thwart the purpose of the Endangered Species Act.

2. More than 1,000 collections in recent years and additional earlier collections from central and east Tennessee have not revealed the presence of the snail darter outside the Little Tennessee River. The TVA has conducted numerous fish population studies throughout the Tennessee River Basin since the 1930's, and none of these studies apparently yielded specimens of the snail darter. The snail darter was probably more widespread prior to the impoundment of most of the large rivers of east Tennessee, but how widespread is uncertain. Despite all efforts to locate additional snail darter populations in rivers and creeks other than the Little Tennessee River, to date there have been no reported findings.

The Tellico Project, now under construction, would completely inundate the entire range and only known established population of the snail darter. The sponsoring agency offers only opinion rather than specific scientific evidence that the snail darter has been found to exist elsewhere. The agency does not deny that the Tellico project will completely inundate the habitat of the only known established population of the fish.

3. The purposes of the Endangered Species Act of 1973 as stated in Section 2(b) are "to provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species * * *". The TVA has formulated and begun to implement a program in which snail darters are being transplanted from the Little Tennessee River into the Hiwassee that there may be biological and other River. That the snail darter does not already inhabit the Hiwassee River, despite the fact that the fish has had access to it in the past, is a strong indication that there may be biological and other factors in this river that negate a successful transplant. In addition, the TVA has presented us with little evidence that they have carefully studied the Hiwassee to determine whether or not these biological and other factors exist. The TVA program also does not provide for the conservation of the ecosystem upon which the only known established population of snail darter depends.

4. The TVA's Tellico Project Environmental Impact Statement was finalized prior to the passage of the Endangered Species Act of 1973. While the Statement did include a discussion of the endangered species which might occur in the project area, the snail darter was not discovered until the fall of 1973 and thus was not included in the discussion of endangered species in the Environmental Impact Statement. Also, all litigation of the Tellico project occurred prior to the discovery of the snail darter. In light of the above, we have no evidence to indicate that the Tennessee Valley Authority has given adequate consideration to the snail darter with respect to the Tellico project.

The Service is aware of the Congressional authorization of the Tellico project. In section 2(a) of the Endangered Species Act of 1973, Congress did find and declare that * * * "(1) various species of fish, wildlife, and plants in the United States have been rendered extinct as a consequence of economic growth and development untempered by adequate concern and conservation * * *". The intent of Congress was to insure that endangered and threatened species are conserved, by responsibly integrating the well-being of such species into all Federal actions that could affect them and providing a means whereby such species can continue to exist. This was specified in Section 2(c) of the Act, which states that "* * * it is further declared to be the policy of Congress that all Federal departments and agencies shall utilize their authorities in furtherance of the purposes of this Act". Section 7 of the Act further delineates the responsibilities of all Federal departments and agencies in implementing the Endangered Species Act of 1973.

The Director has considered the above comments as well as the evidence accompanying such comments. The Director has also considered other information obtained by the Service, both before and after the proposed rulemaking. Taken together, the evidence as a whole indicates that the snail darter of the Little Tennessee River should indeed be listed as an endangered species for the reasons discussed hereafter.

Discussion. Section 4 of the Endangered Species Act of 1973 (16 U.S.C. § 1533(a)(i)) establishes the following criteria for determining whether a species should be listed as an endangered species:

(1) The present or threatened destruction, modification, or curtailment of its habitat or range;

(2) Overutilization for commercial, sporting, scientific or educational purposes;

(3) Disease or predation;

(4) The inadequacy of existing regulatory mechanisms; or

(5) Other natural or manmade factors affecting its continued existence.

Specifically, with regard to the snail darter, present evidence suggests that only condition (1) is pertinent. Major factors affecting this condition include, but are not limited to, the following:

1. The present or threatened destruction, modification, or curtailment of its habitat or range. The snail darter *Percina* (*Imostoma*) sp. is known only from portions of gravel shoals in the main channel of the Little Tennessee River between River Miles 4 and 17 in Loudon County, Tennessee. River Miles 4 and 17 are shown on a map entitled "Tellico Project," prepared by the Tennessee Valley Authority (TVA), Bureau of Water Control Planning, August 1965 (map 65–MS–453 K 501). River Mile 17 is 2 river miles below the U.S. Highway 411 bridge over the Little Tennessee River, and is near Rose Island; River Mile 4 is 1½ miles below Davis Ferry.

In this area the snail darter occurs only in the swifter portions of shoals over clean gravel substrate in cool, low-turbidity water. Food of the snail darter is almost exclusively snails which require a clean gravel substrate for their survival. The proposed impoundment of water behind the proposed Tellico Dam would result in total destruction of the snail darter's habitat.

2. Overutilization for commercial sporting, scientific, or educational purposes. Not applicable.

3. Disease or predation. Not applicable.

4. The inadequacy of existing regulatory mechanisms. Not applicable.

5. Other natural or manmade factors affecting its continued existence. Not applicable.

For the reasons stated above, it is hereby determined that the snail darter (*Percina* (*Imostoma*) sp.) is an endangered species within the meaning of the Endangered Species Act of 1973 (16 U.S.C. 1531–1543).

Accordingly, Part 17 of Chapter I, Title 50, Code of Federal Regulations, is amended as set forth below, and will be effective on November 10, 1975.

Dated: October 6, 1975.

LYNN A. GREENWALT,
Director,
Fish and Wildlife Service.

1. Amend Section 17.11(i) by adding the following to the list of "Fishes," after the entry for "Darter, Oklaloosa; *Ethcostoma, Okaloosae*":

§ 17.11 ENDANGERED AND THREATENED WILDLIFE

* * * * * *

(i) * * *

Species			Range		Status	When Listed	Special Rules
Common Name	Scientific Name	Population	Known Distribution	Portion of Range where Threatened or Endangered			
FISHES							
*	*	*	*	*	*	*	*
Darter, snail	*Percina* (*Imostoma*) sp.	n.a.	U.S.A.: Little Tennessee River, Loudon County, Tennessee.	Entire.	E.	12 n.a.	
*	*	*	*	*	*	*	*

2. Add footnote 12 to read:

[12] 40 FR 47506; October 9, 1975.

[40 Fed. Reg. 17764–65]

ENDANGERED AND THREATENED SPECIES

NOTICE ON CRITICAL HABITAT AREAS

In implementing their responsibilities under the Endangered Species Act of 1973 providing for the protection and conservation of Endangered and Threatened species, the U.S. Fish and Wildlife Service and the National Marine Fisheries Service will be proposing areas to be designated by rulemaking to be "critical habitat" for such species. Except in emergency situations, Governors of States, territories, and possessions will be notified at least 90 days prior to the final rulemaking designating areas within their respective State, territory, or possession as "critical habitat" for Endangered and/or Threatened species.

It is expected that the following concepts and information will be useful to Federal, State, and local government agencies and interested private organizations and individuals in the gathering of information, participation in upcoming public and private meetings, and suggestions for proposing the designation of any habitat as "critical habitat."

One of the purposes of the Endangered Species Act of 1973 (16 U.S.C. 1531–1543), as stated in section 2 (16 U.S.C. 1531), is "* * * to provide a means whereby the ecosystems upon which Endangered species and Threatened species depend may be conserved."

Section 7 (16 U.S.C. 1536) of the Act states as follows:

"The Secretary shall review other programs administered by him and utilize such programs in furtherance of the purposes of this Act. All other Federal departments and agencies shall, in consultation with and with the assistance of the Secretary, utilize their authorities in furtherance of the purposes of this Act by carrying out programs for the conservation of endangered species and threatened species listed pursuant to section 4 of this Act and by taking such action necessary to insure that actions authorized, funded, or carried out by them do not jeopardize the continued existence of such endangered species and threatened species or result in the destruction or modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with the affected States, to be critical."

(The term Secretary as used above means the Secretary of Commerce and/or the Secretary of the Interior.)

Conservation of the earth's resources can maintain ecosystems within which, it is hoped, all species of fauna

and flora can coexist and thereby benefit. The role that natural and man-made factors play in affecting interrelationships between fauna and flora and the ecosystems upon which they depend needs to be recognized. For the continued viability of any species, suitable habitat is not only important but essential to life itself. The term "habitat" could be considered to consist of a spatial environment in which a species lives and all elements of that environment including, but not limited to, land and water area, physical structure and topography, flora, fauna, climate, human activity, and the quality and chemical content of soil, water, and air. *"Critical habitat"* for any Endangered or Threatened species could be the entire habitat or any portion thereof, if, and only if, any constituent element is necessary to the normal needs or survival of that species. The following vital needs are relevant in determining "critical habitat" for a given species:

(1) Space for normal growth, movements, or territorial behavior;

(2) Nutritional requirements, such as food, water, minerals;

(3) Sites for breeding, reproduction, or rearing of offspring;

(4) Cover or shelter; or

(5) Other biological, physical, or behavioral requirements.

The Endangered Species Act of 1973 is intended to prevent the further decline, and to bring about the restoration, of Endangered and Threatened species and of the habitat upon which such species depend. The Act recognizes in section 4 (16 U.S.C. 1533) that the present or threatened destruction, modification, or curtailment of a species' habitat may endanger or threaten that species with extinction. The administration and management of critical habitats provide an important means for protecting species already determined to be Endangered or Threatened and restoring such species to a point at which they are no longer Endangered or Threatened. In order to carry out the intent of the Endangered Species Act of 1973 and to meet the biological needs of the animals and plants involved, the Fish

and Wildlife Service and the National Marine Fisheries Service believe it both necessary and desirable, whenever and wherever possible, to designate "critical habitats." Federal conservation actions involving "critical habitats" may include the development of regulations, land and water acquisition, leasing arrangements, Federal/State cooperation in implementing the Act, and other administrative, research, and management plans and activities.

Actions by a Federal agency which result in the destruction or modification of habitat considered "critical habitat" for a given Endangered or Threatened species would not conform with section 7 of the Endangered Species Act of 1973, if such an action might be expected to result in a reduction in the numbers or distribution of that species of sufficient magnitude to place the species in further jeopardy, or restrict the potential and reasonable expansion or recovery of that species. It must be emphasized that, because the primary intention of the Fish and Wildlife Service and the National Marine Fisheries Service under that Act is to protect, maintain, and restore presently Endangered and Threatened species, application of the term "critical habitat" may not be restricted to the habitat necessary for a minimum viable population.

It is emphasized further that certain actions may not be detrimental to "critical habitat." There may be many kinds of actions which can be carried out within the "critical habitat" of a species that would not be expected to result in such reduction in the numbers or distribution or otherwise adversely affect such species.

The Fish and Wildlife Service and the National Marine Fisheries Service would appreciate receiving information from any Federal, State, or private agency, organization, and/or individuals concerned with Endangered and Threatened species of fauna and flora, including maps, that would assist in delineating the "critical habitat" of those species appearing on the official list of Endangered or Threatened species (50 CFR 17.11, 17.12, or 17.32). Concerned parties also may choose to provide information on the specific kinds of actions that could

be permitted and those that should be prohibited within the area so delineated as "critical habitat." Copies of such information should be sent to both the Director, Fish and Wildlife Service, Washington, D.C. 20240, and, the Director, National Marine Fisheries Service, Washington, D.C. 20235.

As sufficient information on "critical habitat" is gathered for each of the species now listed, the Fish and Wildlife Service and/or the National Marine Fisheries Service will publish a proposed rulemaking in the FEDERAL REGISTER. This rulemaking will identify spatial environments, including geographical boundaries where possible, considered to be "critical habitat" for the Endangered and/or Threatened species in question.

NOTICES

Such identification will permit all Federal agencies to evaluate, prior to final rulemaking, their program for compliance with section 7 (16 U.S.C. 1536): To avoid actions authorized, funded, or carried out by them from destroying or adversely modifying any such "critical habitat" and to enable such agencies to seek the consultation and assistance of the Secretary in utilizing their authorities to further the purposes of the Act. At least 60 days will be allowed for comments, alternative recommendations etc., before publication of a final rulemaking on any specific designation of "critical habitat." As indicated above, Governors of States, territories, and possessions wherein "critical habitat" is to be designated normally will be given at least 90 days notification.

In the future, where deemed appropriate by the Secretary, as new candidate species for the Endangered or Threatened classification are proposed in the FEDERAL REGISTER, each such proposal will contain a proposed designation of "critical habitat" for that species.

LYNN A. GREENWALT,
Director, Fish and Wildlife Service.

APRIL 15, 1975.

JACK W. GEHRINGER,
Acting Director,
National Marine Fisheries Service.

APRIL 15, 1975.

[40 Fed. Reg. 44415–16]

Part 17, Title 50, Code of Federal Regulations, is amended and republished as follows:

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

SUBPART A—INTRODUCTION AND GENERAL PROVISIONS

Sec.
17.1 Purpose of regulations.
17.2 Scope of regulations.
17.3 Definitions.
17.4 Pre-Act wildlife.
17.5 Alaska natives.
17.6 State cooperative agreements [Reserved].
17.7 Captive, self-sustaining populations.

SUBPART B—LISTS

17.11 Endangered and threatened wildlife.
17.12 Endangered and threatened plants [Reserved].
17.13 Amendments to the lists.

SUBPART C—ENDANGERED WILDLIFE

17.21 Prohibitions.
17.22 Permits for scientific purposes, or for the enhancement of propagation or survival.
17.23 Economic hardship permits.

SUBPART D—THREATENED WILDLIFE

17.31 Prohibitions.
17.32 Permits—general.
17.33 Permits—captive, self-sustaining populations.
17.34 Permits. [Reserved]
17.35 Permits. [Reserved]
17.36 Permits. [Reserved]
17.37 Permits. [Reserved]
17.38 Permits. [Reserved]
17.39 Permits. [Reserved]
17.40 Special rules—mammals.
17.41 Special rules—birds. [Reserved]

17.42 Special rules—reptiles.
17.43 Special rules—amphibians. [Reserved]
17.44 Special rules—fishes.
17.45 Special rules—mollusks. [Reserved]
17.46 Special rules—crustaceans [Reserved]
17.47 Special rules—inspects. [Reserved]
17.48 Special rules—other forms. [Reserved]

SUBPART E—SIMILARITY OF APPEARANCE

17.50 General.
17.51 Treatment as endangered or threatened.
17.52 Permits—similarity of appearance.

AUTHORITY: Endangered Species Act of 1973 (16 U.S.C. 1531–1543).

Subpart A—Introduction and General Provisions

§ 17.1 PURPOSE OF REGULATIONS

(a) The regulations in this part implement the Endangered Species Act of 1973, 87 Stat. 884, 16 U.S.C. 1531–43.

(b) The regulations identify those species of wildlife and plants determined by the Director to be endangered or threatened with extinction under section 4(a) of the Act and also carry over the species and subspecies of wildlife designated as endangered under the Endangered Species Conservation Act of 1969 (83 Stat. 275, 16 U.S.C. 668cc–1 to 6) which are deemed endangered species under section 4(c)(3) of the Act.

§ 17.2 SCOPE OF REGULATIONS.

(a) The regulations of this part apply only to endangered and threatened wildlife and plants.

(b) By agreement between the Service and the National Marine Fisheries Service, the jurisdiction of the Department of Commerce has been specifically defined to include certain species, while jurisdiction is shared in regard to certain other species. Such species are footnoted in Subpart B of this part, and reference is given to special rules of the National Marine Fisheries Service for those species.

(c) The provisions in this part are in addition to, and are not in lieu of, other regulations of this Subchapter B which may require a permit or prescribe additional restrictions or conditions for the importation, exportation, and interstate transportation of wildlife.

(d) The examples used in this part are provided solely for the convenience of the public, and to explain the intent and meaning of the regulation to which they refer. They have no legal significance.

§17.3 DEFINITIONS.

In addition to the definitions contained in Part 10 of this subchapter, and unless the context otherwise requires, in this Part 17:

"Act" means the Endangered Species Act of 1973 (16 U.S.C. 1531–1543; 87 Stat. 884);

"Alaskan Native" means a person defined in the Alaska Native Claims Settlement Act [43 U.S.C. section 1603(b) (85 Stat. 588)] as a citizen of the United States who is of one-fourth degree or more Alaska Indian (including Tsimshian Indians enrolled or not enrolled in the Metlaktla Indian Community), Eskimo, or Aleut blood, or combination thereof. The term includes any Native, as so defined, either or both of whose adoptive parents are not Natives. It also includes, in the absence of proof of a minimum blood quantum, any citizen of the United States who is regarded as an Alaska Native by the Native village or town of which he claims to be a member and whose father or mother is (or, if deceased, was) regarded as Native by any Native village or Native town. Any citizen enrolled by the Secretary pursuant to section 5 of the Alaska Native Claims Settlement Act shall be conclusively presumed to be an Alaskan Native for purposes of this part;

"Authentic native articles of handicrafts and clothing" means items made by an Indian Aleut, or Eskimo which (a) were commonly produced on or before December 28, 1973, and (b) are composed wholly or in some significant respect of natural materials and (c) are significantly altered from their natural form and which are produced, decorated, or fashioned in the exer-

cise of traditional native handicrafts without the use of pantographs, multiple carvers, or similar mass copying devices. Improved methods of production utilizing modern implements such as sewing machines or modern techniques at a tannery registered pursuant to § 18.23 (c) of this subchapter (in the case of marine mammals) may be used so long as no large scale mass production industry results. Traditional native handicrafts include, but are not limited to, weaving, carving, stitching, sewing, lacing, beading, drawing, and painting. The formation of traditional native groups such as cooperatives, is permitted so long as no large scale mass production results;

"Endangered" means a species of wildlife listed in § 17.11 or a species of plant listed in § 17.12 and designated as endangered.

"Harass" in the definition of "take" in the Act means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering.

"Harm" in the definition of "take" in the Act means an act or omission which actually injures or kills wildlife, including acts which annoy it to such an extent as to significantly disrupt essential behavioral patterns, which include, but are not limited to, breeding, feeding or sheltering; significant environmental modification or degradation which has such effects is included within the meaning of "harm";

"Industry or trade" in the definition of "commercial activity" in the Act means the actual or intended transfer of wildlife or plants from one person to another person in the pursuit of gain or profit;

"Native village or town" means any community, association, tribe, clan or group;

"Population" means a group of fish or wildlife in the same taxon below the sub-specific level, in common spatial arrangement that interbreed when mature;

"Specimen" means any animal or plant, or any part, product, egg, seed or root of any animal or plant;

"Subsistence" means the use of endangered or threatened wildlife for food, clothing, shelter, heating, transportation and other uses necessary to maintain the life of the taker of the wildlife, or those who depend upon the taker to provide them with such subsistence, and includes selling any edible portions of such wildlife in native villages and towns in Alaska for native consumption within native villages and towns;

"Threatened" means a species of wildlife listed in § 17.11 or plant listed in § 17.12 and designated as threatened.

"Wasteful manner" means any taking or method of taking which is likely to result in the killing or injury of endangered or threatened wildlife beyond those needed for subsistence purposes, or which results in the waste of a substantial portion of the wildlife, and includes without limitation the employment of a method of taking which is not likely to assure the capture or killing of the wildlife, or which is not immediately followed by a reasonable effort to retrieve the wildlife.

[40 Fed. Reg. 58308, 58310]

DEPARTMENT OF THE INTERIOR

U.S. Fish and Wildlife Service

[50 CFR Part 17]

ENDANGERED AND THREATENED WILDLIFE AND PLANTS

Proposed Determination of Critical Habitat for Snail Darter, American Crocodile, Whooping Crane, California Condor, Indiana Bat and Florida Manatee

The Director, United States Fish and Wildlife Service, hereby issues a proposed rulemaking which would determine critical habitat for six endangered species, pursuant to section 7 of the Endangered Species Act of 1973 [16 U.S.C. 1531–1543]. An interpretation of the term critical habitat was published by the Fish and Wildlife Service and the National Marine Fisheries Service in the

Federal Register of April 22, 1975 [40 FR 17764–17765], and a notice of intent to determine critical habitat for five of the six species named below was published by the Fish and Wildlife Service in the Federal Register of May 16, 1975 [40 FR 21499–21500].

The areas delineated below do not necessarily include the entire critical habitat of any of the name species, and modifications to critical habitat descriptions may be proposed in the future. In accordance with section 7 of the Endangered Species Act of 1973, all Federal departments and agencies would be required to insure that actions authorized, funded, or carried out by them do not result in the destruction or modification of the critical habitat of the six named species found within the areas delineated below.

It is recognized that some of the delineated areas are large and may contain man-made structures, settlements, and other localities that are not of primary use to the species involved. It should be stressed, however, that this is only a proposed rulemaking that is setting forth the outer parameters of the critical habitat areas in question, and that based upon the comments received and additional studies conducted by the Fish and Wildlife Service, the final rulemaking will exclude those settlements and structures devoid of critical habitat significance.

Until the issuance of additional guidelines, all Federal departments and agencies should, in accordance with section 7 of the Endangered Species Act, consult with the Secretary of the Interior with respect to any actions which might reasonably be expected to affect critical habitat within the delineated areas.

BASIS FOR DETERMINATION

SNAIL DARTER (Percina Imostoma) SP

Tennessee. Critical habitat for the snail darter extends from river mile 0.5 to river mile 17 of the Little Tennessee River, Loudon County, Tennessee. River miles 0.5 through 17 are shown on a map entitled "Tellico Project," prepared by the Tennessee Valley Authority (TVA), Bureau of Water Control Planning, August

1965 (map 65–MS–453 K 501). River mile 17 is two river miles below the U.S. Highway 411 bridge over the Little Tennessee River, and is near Rose Island; river mile 0.5 on the Little Tennessee River is one half mile upstream from its confluence with the Tennessee River. Presently, this section of river is the only known existing habitat of the snail darter. In portions of this area, certain conidtions exist which are required by the species, and the disruption of these conditions would lead to decline or extinction of the snail darter.

PROCEDURES

The rule proposed in this notice will be followed by a more complete rulemaking on the entire subject of critical habitat. That rulemaking will codify, among other things, the criteria for determining critical habitat and general rules for Federal agencies. At the time that this future rulemaking is adopted, the specific determinations proposed here for these six species will become part of that rulemaking. In the interim, this special designation of critical habitat, upon final rulemaking, will be found in new §§ 17.81 through 17.86, under Subpart F—Critical Habitats, 50 CFR Part 17. This Subpart was proposed to be added to Part 17 by the proposed regulation for determining critical habitat for the Mississippi sandhill crane (40 FR 40521–40522, September 3, 1975).

PUBLIC COMMENTS SOLICITED

The Director intends that finally adopted rules be as responsive as possible to the conservation of the critical habitat of endangered and threatened species. The Director therefore desires to obtain the comments and suggestions of the public, other concerned government agencies, and private interests on these proposed rules.

Final promulgation of critical habitat regulations will take into consideration the comments received by the Director. Such comments and any additional information received may lead the Director to adopt final regulations that differ from this proposal.

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SUBMITTAL OF WRITTEN COMMENTS

Interested persons may participate in this rulemaking by submitting written comments, preferably in triplicate, to the Director (FWS/LE), U.S. Fish and Wildlife Service, P.O. Box 19133. Washington, D.C. 20036, All relevant comments received no later than February 20, 1976, will be considered. The Service will attempt to acknowledge receipt of comments, but substantive responses to individual comments may not be provided. Comments received will be available for public inspection during normal business hours at the Service's Office in Suite 600, 1612 K Street NW., Washington, D.C.

Accordingly, it is hereby proposed to amend 50 CFR Part 17 to determine critical habitat for the following endangered species, as shown below.

Dated: November 12, 1975.

LYNN A. GREENWALT,
Director,
Fish and Wildlife Service.

1. Amend the proposed Subpart F. 50 CFR Part 17, by adding the following new §§ 17.81 through 17.86.

Subpart F—Critical Habitat

Sec.
17.81 Snail darter.
17.82 American crocodile.
17.83 Whooping crane.
17.84 California condor.
17.85 Indiana bat.
17.86 Florida manatee.

§ 17.81 SNAIL DARTER.

(a) The following area is critical habitat for the snail darter (*Percina* (*Imostoma*) sp.): From river mile 0.5 to river mile 17 of the Little Tennessee River, Loudon County, Tennessee, as shown on map entitled "Tellico Project", prepared by Tennessee Valley Authority, Bureau of Water Control Planning, August 1965 (map 65–MS–453 K 501).

(b) Pursuant to section 7 of the act, all Federal agencies must take such action as is necessary to insure that actions authorized, funded, or carried out by them do not result in the destruction or modification of this critical habitat area.

[41 Fed. Reg. 13926–28]

Title 50—Wildlife and Fisheries

Chapter I—United States Fish and Wildlife Service, Department of the Interior

Part 17—Endangered and Threatened Wildlife and Plants

Snail Darter

Background. On December 16, 1975, the United States Fish and Wildlife Service proposed to amend 50 CFR Part 17 by designating critical habitat for the snail darter and five other species (40 FR 58308). The snail darter, *Percina* (*Imostoma*) sp., (now known as *Percina tanasi*) was listed as an endangered species, pursuant to Section 4 of the Endangered Species Act of 1973 (16 USC 1533), on October 9, 1975 (40 FR 47505). This amendment adds a new subpart and a new section to Part 17 relative to the critical habitat of the snail darter. Action on the critical habitats of the five other species covered in the proposal will be forthcoming later.

The Endangered Species Act of 1973 conserves endangered and threatened species in several ways. One of those ways is by authorizing the Secretary to determine that the habitat of a species is critical. When such a determination is made, any Federal agency which might authorize, fund, or carry out an action which could result in the modification or destruction of such habitat must take whatever steps are necessary to avoid the modification or destruction.

In the Federal Register of April 22, 1975, 40 FR 17764–17765, the Fish and Wildlife Service and the

National Marine Fisheries Service published the following interpretation:

The term "habitat" could be considered to consist of a special environment in which a species lives and all elements of that environment including, but not limited to, land and water area, physical structure and topography, flora, fauna, climate, human activity, and the quality and chemical content of soil, water and air.

"Critical habitat" for any endangered or threatened species could be the entire habitat or any portion thereof, if, and only if, any constituent element is necessary to the normal needs or survival of that species.

Also, in the FEDERAL REGISTER of April 22, 1975, the Fish and Wildlife Service and the Natural Marine Fisheries Service published the following statement:

"Actions by a Federal agency which result in the destruction or modification of a habitat considered "critical habitat" for a given Endangered or Threatened species would not conform with Section 7 of the Endangered Species Act of 1973, if such action might be expected to result in a reduction in the numbers or distribution of that species of sufficient magnitude to place the species in further jeopardy, or restrict the potential and reasonable expansion or recovery of that species. It must be emphasized that because of the primary intention of the Fish and Wildlife Service and the National Marine Fisheries Service under that Act is to protect, maintain, and restore presently Endangered and Threatened species, application of the term "critical habitat" may not be restricted to the habitat necessary for a minimum viable population."

The Director is preparing, in consultation with the affected agencies, guidelines for Federal agencies for the application of section 7 of the Act. In the future, regulations will be published regarding section 7.

The snail darter critical habitat proposal as it appeared in the FEDERAL REGISTER (Vol. 40, No. 242, pp. 58308–58312) is as follows:

BASIS FOR DETERMINATION

SNAIL DARTER (*Percina* (*Imostoma*) SP.)

Tennessee. Critical habitat for the snail darter extends from river mile 0.5 to river mile 17 of the Little Tennessee River, Loudon County, Tennessee. River miles 0.5 through 17 are shown on a map entitled "Tellico Project," prepared by the Tennessee Valley Authority (TVA), Bureau of Water Control Planning, August 1965 (map 65–MS–453 K 501). River mile 17 is two river miles below the U.S. Highway 411 bridge over the Little Tennessee River, and is near Rose Island; river mile 0.5 on the Little Tennessee River is one half mile upstream from its confluence with the Tennessee River. Presently, this section of river is the only known existing habitat of the snail darter. In portions of this area, certain conditions exist which are required by the species, and the disruption of these conditions would lead to decline or extinction of the snail darter.

At the time of publication the snail darter had not been assigned a specific scientific name in the scientific literature. However, on January 22, 1976, Dr. David A. Etnier described and assigned a specific scientific name to the snail darter in the Proceedings of the Biological Society of Washington, Vol. 88, No. 44, pp. 469–488 in a paper entitled "*Percina* (*Imostoma*) *tanasi*, a new percid fish from the Little Tennessee River, Tennessee." In the future, reference to the scientific name of the snail darter should be *Percina tanasi*. Also when the proposal was published the snail darter was not known to occur below river mile 0.5 on the Little Tennessee River; however, it has recently been found between river mile 0.1 and 0.4, below Tellico Dam. Based on this discovery, the present known existing habitat would be between river mile 0.1 and 17 on the Little Tennessee River.

Summary of Comments. A total of 19 comments were received relative to the proposal to determine a portion

of the Little Tennessee River as critical habitat for the snail darter, *Percina tanasi*, which was published in the FEDERAL REGISTER, Vol. 40, No. 242, Tuesday, December 16, 1975, pages 58308–58312. These comments are summarized as follows:

(1) Seventeen of the 19 comments received completely supported the proposal to delineate a portion, river mile 0.5 to 17, of the Little Tennessee River as critical habitat for the snail darter. These include professional biological societies, national and State conservation associations and a national sportsman organization. The State of Tennessee, through the Tennessee Wildlife Resources Agency, supported the critical habitat designation as proposed. In addition, several citizens from the area submitted letters in support of the proposal.

(2) One letter opposing the proposal was received from an individual living in the area. There was no factual information presented by this individual to warrant any change of the proposed critical habitat.

(3) A letter with attached appendices was received from the Tennessee Valley Authority, the agency sponsoring the construction of the Tellico Dam Project. The Tennessee Valley Authority was not opposed to the proposal, but felt it should not be adopted at the present time. Quoted below are the specific reasons why the TVA felt that the proposal should not be adopted.

1. The river mile designation of 0.5 to 17 appears to be in error since significant numbers of the snail darter have been discovered between river mile 0.1 and river mile 0.4 of the Little Tennessee River. These discoveries, which were previously reported, were made downstream from Tellico Dam, in depths of 20 to 30 feet. The importance of these discoveries has not yet been determined, and critical habitat determination should be postponed until evaluation of these discoveries is completed.

2. Although the existence of the snail darter in the proposed critical habitat area does indicate that at least some of the critical needs of the snail darter are met in this particular habitat, the identification of these

critical needs is not yet complete. TVA, in conjunction with Jones & Stokes Associates, Inc., a biological consulting firm in Sacramento, California, is presently conducting a detailed field study and analysis of the biotic and abiotic characteristics of the lower 17 miles of the Little Tennessee River and how these factors relate to the life history of this species. An interim report covering all, or virtually all, of the abiotic characteristics of the Little Tennessee River and the biotic characteristics for the fall and winter seasons will be available in approximately 60 days. The final report, completing the description of the abiotic characteristics and providing the biotic characteristics of the spring and summer seasons, will be available by October 1, 1976.

Determination of critical habitat without information such as will be provided by these studies could subject such a determination to substantial criticism by the scientific community since such a determination would be based upon the lack of scientific data rather than specific scientific support.

The Director has reviewed the comments and the attachments submitted by the Tennessee Valley Authority in their response to the FWS proposal to delineate critical habitat for the snail darter, *Percina tanasi*. Other documents submitted to the FWS by the TVA and individual biologists have also been reviewed by the Director. The response to the TVA comments presented below is based on information presently available.

1. The designation of river mile 0.5 to 17 in the Little Tennessee River in the original snail darter critical habitat proposal was based on information available at that time. Subsequent to the publication of the critical habitat proposal additional information was received from TVA indicating that the snail darter had been observed in water 20 to 30 feet deep between river mile 0.4 to 0.1 on the Little Tennessee River. While this area may also be critical habitat, we do not feel that this has any bearing on the present proposal. As was pointed out in the snail darter critical habitat proposal (Paragraph 2, page 58308, FEDERAL REGISTER, Vol. 40, No. 242, December 16, 1975), "The areas delineated below

do not necessarily include the entire critical habitat of any of the named species and modifications to critical habitat descriptions may be proposed in the future." Based on information contained in the TVA snail darter conservation program progress report, the area below the Tellico Dam between river mile 0.4 to 0.1 on the Little Tennessee may very well represent additional critical habitat. If this area is found to be critical it, along with any other critical areas found subsequent to this rulemaking, will be proposed and published in the FEDERAL REGISTER for review and comments.

2. We interpret the year-round occurrence of adult snail darters including large numbers of gravid males and females in the Little Tennessee River between river mile 0.5 to 17, the area proposed as critical habitat, as evidence that this area is critical habitat. This point is made by TVA in their comments submitted on the proposal and we quote: "Although the existence of the snail darter in the proposed critical habitat area does indicate that at least some of the critical needs of the snail darter are met in this particular habitat, the identification of these critical needs is not yet complete." Even though the identification of most of the links between the snail darter and its abiotic and biotic environment have not been specifically determined, we do not feel that this should prevent the designation of critical habitat.

Discussion. The information presently available indicates that the Little Tennessee River between river mile 0.5 and 17 on the Little Tennessee is critical to the survival of the snail darter, *Percina tanasi.* As was pointed out above, we were not aware of the presence of the snail darter below Tellico Dam at river mile 0.1 to 0.4 prior to the publication of the proposal on December 16, 1975. The fact that this area 0.1 to 0.4 is inhabited by the snail darter does not invalidate the area proposed as critical habitat. The area between river mile 0.1 to 0.4 on the Little Tennessee River may also be critical habitat, and if this is found to be the case it will be proposed in the future. There are no restrictions which would prohibit the changes in the area or areas originally delineated as critical habitat.

Final Rulemaking—The Director has considered all comments and data submitted in response to the proposed determination of the critical habitat of the snail darter. The Director has also considered other information received by the Fish and Wildlife Service both prior to and subsequent to the publication of the proposal in the FEDERAL REGISTER. Based on this review, the area between river mile 0.5 to 17 in the Little Tennessee River is determined to be critical habitat for the snail darter, *Percina tanasi.*

These amendments will become effective on May 3, 1976.

Dated: March 29, 1976.

GEORGE W. MILIAS,
Acting Director,
Fish and Wildlife Service.

1. Amend the table of sections in 50 CFR Part 17 by adding a new Subpart F, reading as follows:

Subpart F—Critical Habitat

Sec.
17.80 [Reserved]
17.81 Snail Darter

2. Amend the new Subpart F, 50 CFR Part 17 by adding the following new § 17.81:

Subpart F—Critical Habitat

§ 17.80 [Reserved]
§ 17.81 Snail darter.

(a) The following area is critical habitat for the snail darter (*Percina* (*Imostoma*) sp.): From river mile 0.5 to river mile 17 of the Little Tennessee River, Loudon County, Tennessee, as shown on a map entitled "Tellico Project", prepared by Tennessee Valley Authority, Bureau of Water Control Planning, August 1965 (map 65–MS–453 K 501).

(b) Pursuant to section 7 of the act, all Federal agencies must take such action as is necessary to insure that actions authorized, funded, or carried out by them do not result in the destruction or modification of this critical habitat area.

[EXHIBIT 9]

October 20, 1975

3-24-78 9

Mr. Lynn Seeler
General Manager
Tennessee Valley Authority
New Sprankle Building
Knoxville, Tennessee 37902

Dear Mr. Seeler:

On October 10, 1975 (?) the Snail Darter, Percina (Imostoma) tanasi, was listed in the Federal Register as "endangered" by the United States Department of the Interior. Despite this determination, the Tennessee Valley Authority has continued not only the construction of Tellico Dam, the closing of which will render extinct all naturally occurring snail darters, but also has engaged in significant clear-cut logging in the area of the heaviest known concentration of the species.

As you know, Section 7 of the Endangered Species Act of 1973, 16 U.S.C. § 1536, requires federal agencies to take

> such action necessary to insure that actions authorized, funded or carried out by them do not jeopardize the continued existence of . . . endangered and threatened species or result in the destruction or modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with the affected States, to be critical.

The continuation of the practices outlined in the preceding paragraph constitute a violation of Section 7 of the Act, and we respectfully request that they be discontinued.

Sincerely,

Zygmunt J. B. Plater
Assistant Professor

Donald S. Cohen
Assistant Dean

Hank Hill
Third-year law student

ZP, DC, Hl/ar

bcc: Robert Golten

BEST COPY AVAILABLE

[EXHIBIT 10]

October 20, 1975

3-24-78 EXHIBIT 10

Mr. Nathaniel Reed
Assistant Secretary
Fish and Wildlife and Parks
United States Department of the Interior
Washington, D.C. 20240

Dear Secretary Reed:

On October 10, 1975 (?) the Snail Darter, Percina (Imostoma) tanasi, was listed in the Federal Register as "endangered" by the United States Department of the Interior. Despite this determination, the Tennessee Valley Authority has continued not only the construction of Tellico Dam, the closing of which will render extinct all naturally occurring snail darters, but also has engaged in significant clear-cut logging in the area of the heaviest known concentration of the species.

As you know, Section 7 of the Endangered Species Act of 1973, 16 U.S.C. § 1536, requires federal agencies to take

> such action necessary to insure that actions authorized, funded or carried out by them do not jeopardize the continued existence of . . . endangered and threatened species or result in the destruction or modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with the affected States, to be critical.

The continuation of the practices outlined in the preceding paragraph constitute a violation of Section 7 of the Act, and we respectfully request that the Interior Department take all action necessary to enforce the Act, pursuant to 16 U.S.C. § 1540 (e)(1).

Sincerely,

Zygmunt J. B. Plater
Assistant Professor

Donald S. Cohen
Assistant Dean

Hank Hill
Third-year law student

ZP, DC, Hl/ar

bcc: Robert Golten

United States of America

DEPARTMENT OF THE INTERIOR
Washington, D. C.

I certify that the official records of the Department of the Interior are in my *gal custody and attest that each annexed paper is a true copy of a document* *mprising part of the official records of the Department of the Interior:*

letter concerning the Department's responsibilities under the Endangered ecies Act of 1973 and our position on the effect of TVA's Tellico Dam oject upon the endangered snail darter, Percina (Imostoma) tanasi.

3-24-78 33

ESTIMONY WHEREOF, I have subscribed my name, and caused the seal of the Department of the Interior to be affixed on this 23rd day of April, 1976

William L'Carpenter
DIRECTOR OF MANAGEMENT OPERATIONS

[EXHIBIT 33]

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

April 27, 1976

Mr. Zymunt J. B. Plater
The University of Tennessee
College of Law
1505 West Cumberland Avenue
Knoxville, Tennessee 37916

Dear Mr. Plater:

Your recent letter asks a number of questions concerning the Department's responsibilities under the Endangered Species Act of 1973 and our position on the effect of TVA's Tellico Dam project upon the endangered snail darter, Percina (Imostoma) tanasi. We are pleased to have this opportunity to clearly state our position on these questions.

Our position has always been that the Department of the Interior has primary responsibility for implementing and enforcing the Act for those species not assigned to the Secretary of Commerce pursuant to Reorganization Plan No. 4. Director Greenwalt of the Fish and Wildlife Service (FWS) advised Chairman Wagner, TVA, of this on October 29, 1975, when he wrote saying, "Authority for enforcement of the Act, insofar as this species is concerned, is vested in the Department of the Interior." We agree with the United States Court of Appeals for the Fifth Circuit, in its opinion on the Mississippi sandhill crane, National Wildlife Federation v. Coleman, No. 75-3256 (5th Cir. March 25, 1976), when it stated with respect to section 7, "The primary responsibility for implementing section 7 is on the Secretary of Interior." (Slip opinion at p. 2569.)

Continuing the precedent of earlier endangered species legislation, Congress recognized the expertise on fish, wildlife and endangered species matters within the Department of the Interior when it passed the Endangered Species Act of 1973. It is our responsibility to interpret the terms and requirements of the Act, to promulgate regulations, to list endangered and threatened species, and to determine critical habitat.

We recently concluded an important step in this process with dissemination of guidelines on section 7 for use by Federal agencies (copy enclosed). The guidelines set out working concepts of what is meant by such key terms as "critical habitat," "jeopardize the continued existence of," and "destruction or (adverse) modification." These guidelines will be the starting point for regulations governing activities falling within section 7 of the Act that the Department is preparing and will publish as soon as all necessary reviews have been completed.

The guidelines set forth our responsibility under the consultation procedures of section 7. We provide other Federal agencies with our expert biological opinions on the effect of their actions upon endangered species or their habitats. When requested, we make recommendations for modifications to proposed projects to eliminate conflicts with the mandatory requirements of that section.

Given our responsibility to implement the Act and the biological expertise within the FWS, we expect our biological opinions to be given great weight in a Federal agency's decisionmaking. The expert opinions of FWS biologists will be part of the administrative record before each Federal agency. It then becomes the responsibility of the implementing Federal agency to decide for itself if it has taken all actions necessary to insure that the continued existence of an endangered or threatened species will not be jeopardized or critical habitat of such species modified or destroyed.

As to the Tellico Dam project, the FWS has on many occasions expressed its biological opinion concerning the dam's effect on the snail darter and its critical habitat. The following quotations are taken from official correspondence, memoranda, reports and publications in FWS files:

1. "The proposed impoundment of water behind the proposed Tellico Dam would result in total destruction of the snail darter's habitat." (40 Fed. Reg. 47506, October 9, 1975, Listing of snail darter as endangered.)

2. "It has been determined by Fish and Wildlife Service biologists that this fish would become extinct if the Tellico Dam Project of the Tennessee Valley Authority is completed." (Memorandum from the Director, Fish and Wildlife Service to the Secretary of the Interior through the Assistant Secretary for Fish and Wildlife and Parks, dated October 8, 1975; Subject, Secretarial Alert on Listing the Snail Darter (a fish) as an Endangered Species.)

3. "The extensive fact-finding which preceded our determination of the endangered status of this fish substantiates, in our opinion, the contention that your agency's Tellico Dam project, if continued as presently planned, will result in destruction of the ecosystem upon which this endangered species depends. This undoubtedly will result in the extinction of the established natural populations of this species, a result obviously contrary to the policies and purposes of the Act...Obviously, closing of the dam and filling of the reservoir in December 1976 or January 1977 constitutes the action which, in our opinion, will ultimately jeopardize the continued existence of the Snail Darter, undoubtedly destroying the existing established population of the species." (Letter from Director Greenwalt to Chairman Wagner, TVA, October 29, 1975, requesting that TVA begin consultation as required by section 7 of the Act.)

4. "The proposed Tellico Dam would result in total destruction of the snail darter's habitat. (page 2)...The reservoir would eliminate the only known population of the snail darter, rendering the species extinct. (page 6)...Also, available scientific evidence indicates that the TVA Tellico Project, if completed as planned, will destroy the snail darter in its only known location." (page 10.) (Environmental Assessment prepared prior to final rulemaking listing the snail darter as an endangered species.)

The sum and substance of the quoted statements is that if the Tellico Dam is constructed as planned, it will jeopardize the continued existence of the snail darter and destroy the essential constituent elements of its critical habitat. Although consultation with TVA has begun in recent months, to date the discussions have been limited to the snail darter transplant program and have not dealt with the problems posed for the snail darter by Tellico Dam itself.

Recent assertions that the snail darter exists elsewhere than in that portion of the Little Tennessee River declared to be critical habitat do nothing to change the Service's position. The biological evidence remains that if the Little Tennessee River is impounded by Tellico Dam, the continued existence of the snail darter will be jeopardized and its critical habitat destroyed.

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I hope these statements answer the concerns expressed in your recent letter and give a clear presentation of the Department's position on the biological impacts of the Tellico Dam project upon the snail darter and its habitat.

Sincerely yours,

Nathaniel P. Reed
Assistant Secretary for
Fish and Wildlife and Parks

Enclosure

GUIDELINES TO ASSIST FEDERAL AGENCIES IN COMPLYING WITH SECTION 7 OF THE ENDANGERED SPECIES ACT OF 1973

The following guidelines were prepared by the United States Fish and Wildlife Service (FWS), U. S. Department of the Interior, and the National Marine Fisheries Service (NMFS), U. S. Department of Commerce to assist the Federal Departments and agencies (hereinafter referred to as Federal agency or agencies) in meeting their responsibilities under section 7 16 U.S.C. §§ 1537, of the Endangered Species Act of 1973 (hereinafter referred to as the Act), 16 U.S.C. §§ 1531-1543 (Supp. III, 1973).

The guidelines were developed at the request of Federal agencies at a May 29, 1975, conference on the Act and its implication on Federal activities and programs. In response to the request, an Ad Hoc Interagency Committee was convened by the Directors, FWS and NMFS, to advise the two Services in developing the necessary guidance. The Committee was composed of representatives from 11 Federal agencies who were instrumental in providing advice necessary to reflect the guidance needs for a wide range of Federal activities and programs.

The guidelines are intended to furnish a broad framework within which Federal agencies may prepare internal procedures to guide their activities or programs in fulfilling the requirements of section 7 of the Act. The guidelines also are intended to be sufficiently flexible so that they can be applied to the diverse activities and programs undertaken by Federal agencies which may have an effect upon Endangered or Threatened species (hereinafter referred to as listed species) or their habitats. Activities and programs as used herein apply to all actions authorized, funded, or carried out by Federal agencies, examples of which include but are not limited to, (1) programs or activities intended to conserve listed species or their habitats, (2) promulgation of regulations which would beneficially or detrimentally affect listed species or their habitats, (3) granting of licenses, contracts, leases, easements, rights-of-way, permits, or grants-in-aid, which might affect listed species or their habitats, or (4) activities or programs directly or indirectly, causing physical modifications to the land, water, or air within the range or habitat area of listed species.

The respective jurisdictions of the Secretaries of Interior and Commerce for listed species of fauna were established by Reorganization Plan Number 4 of 1970, 5 U.S.C. App. (1970). A Memorandum of Understanding, dated August 28, 1974 (copy

attached), further defines the jurisdictional responsibilities of the two Services. The FWS and the NMFS have been delegated the responsibilities of the Departments of Interior and Commerce for implementing the Act and their responsibilities were identified in the December 3, 1974 letter to the various Federal agencies from the Secretaries of Interior and Commerce. (Copy attached) The lists of Endangered and Threatened native and foreign fauna under the jurisdiction of the FWS and the NMFS are found in 50 C.F.R. 17.11. The NMFS regulations specify those species of fauna under its jurisdiction and are contained in 50 C.F.R. 22.23, 39 Fed. Reg., 41367-41377, November 27, 1974. Jurisdiction over Endangered and Threatened flora is divided among the Secretaries of Agriculture, Commerce, and Interior, as defined by the Act. The Secretary of Agriculture's responsibility is limited to importation and exportation of terrestrial plants. Other functions under the Act relating to terrestrial plants such as listing and section 7 consultation and assistance, and all functions relating to marine plants are the responsibilities of the Secretaries of the Interior and Commerce. No agreement is presently in effect as to the division of these responsibilities for plants between the Secretaries of Commerce and Interior but one is expected prior to the listing of flora species.

It is not the intent or purpose of the FWS or the NMFS through the issuance of these guidelines to hinder, halt, or preempt actions or statutory requirements of other Federal agencies. Rather, the guidelines are provided only to assist the Federal agencies in meeting their responsibilities under section 7 of the Act. Furthermore, the Federal agencies are not obligated to adopt in whole or in part the guidelines presented here. They may be used by the Federal agencies at their discretion.

The consultation and assistance process proposed here is viewed as a means of providing responsible Federal agencies with the benefit of information, biological opinions, and expertise available in the FWS and the NMFS on the effects of actions upon listed species and their habitats. Such information and expertise might otherwise not come to the attention of the Federal agencies during the planning and implementation of their actions. This process is also viewed as essential for coordinating all research, investigations, studies for management or conservation programs pertaining to listed species and their habitats as well as disseminating such information throughout the government.

These guidelines are distributed to the Federal agencies for their internal guidance and will not be published in the Federal Register. The Federal agencies should be aware,

however, that these guidelines will be used as a starting point for the development and promulgation of regulations. Rulemaking procedures will be followed which will afford all interested Federal agencies, as well as members of the public, an opportunity to comment on proposed regulations before they become final. In addition, the guidelines do not offer guidance in respect to complying with State laws or regulations concerning listed species or species considered threatened with extinction within the States.

I. Section 7 - General Parameters

A. Scope of Section 7

1. Section 7 applies to listed species of fauna and flora (although no flora species are presently listed, listings are anticipated by early 1976).

2. Section 7 applies to activities and programs by Federal agencies affecting listed species in foreign countries and on the high seas, as well as in the United States. (The concept of jeopardy applies to all listed species, native and foreign. Whether the critical habitat concept applies in foreign countries or not is an unresolved question at this time).

B. Requirements of section 7

1. All Federal agencies, including Services, Bureaus and Offices within the Departments of the Interior and Commerce, in consultation with the FWS or NMFS and with their assistance, shall utilize their authorities in furthering the purposes of the Act.

a. The FWS has been delegated the Secretary of Interior's primary responsibility for implementing the Act by 242 DM 1 and 632 DM 1.4. The October 16, 1974, memorandum from the Secretary of Interior to Assistant Secretaries and Heads of Bureaus and Offices further defines the responsibilities of the FWS.

b. The NMFS has been delegated the Secretary of Commerce's responsibility for implementing the Act by memoranda dated February 4, 1974, in which the Secretary delegated his authority

to the Administrator of the National Oceanic and Atmospheric Administration and such authority was then delegated to NMFS by Memorandum, dated March 11, 1974.

c. The December 3, 1974, letter from the Secretaries of Interior and Commerce provided additional definition of the responsibilities of the FWS and the NMFS in coordinating and implementing the Act for the respective Departments.

2. Within the limits or opportunities of their authorities, Federal agencies shall carry out programs for the conservation of listed species.

3. Federal agencies shall not authorize, fund, or carry out actions that will result in jeopardizing the continued existence of listed species.

4. Federal agencies shall not authorize, fund or carry out actions that will result in the destruction or adverse modification of the habitats of listed species that have been determined critical by the Secretary, through the Director, FWS or NMFS, after consultation as appropriate, with the affected States.

It is recognized that modification of critical habitat can have beneficial or detrimental effects on listed species. It was clearly the intent of Congress that "modification" as used in section 7 applies to adverse modification. On the other hand, carrying out programs for the conservation of listed species, as required in section 7, could include beneficial habitat modifications. In either case, consultation should be undertaken to insure that available information and expertise can be provided. After consultation, if an activity or program is determined to be beneficial for the habitat of a listed species, but its implementation could constitute a violation of section 9 of the Act, a permit should be requested pursuant to section 10(a) of the Act and applicable FWS or NMFS regulations.

C. Working Concepts

The following are considered to be "working" concepts that can be used to clarify key terms in section 7. It must be emphasized that these are

not definitions but are concepts to assist the Federal agencies in clarification of the terms.

1. "Critical Habitat" - means any air, land, or water area including any elements thereof which the Secretary, through the Director, FWS or NMFS, has determined is essential to the survival of wild populations of a listed species or to its recovery to a point at which the measures provided pursuant to the Act are no longer necessary (hereinafter referred to as recovery). Determinations will be published in the Federal Register.

2. "Jeopardize the Continued Existence of" - means any action which reasonably would be expected to result in the reduction of the reproductive ability, numbers, or distribution of a listed species to such an extent that the loss would pose a threat to the continued survival or recovery of these species in the wild. This reduction in reproductive ability, numbers, or distribution of listed species would be expected to vary from species to species. In some cases, such as the Whooping crane or Hawiian crow, it could be a single individual, in other cases, such as an endangered invertebrate, it could be as high as scores, hundreds, or more.

3. "Destruction or (Adverse) Modification" - means any act which would have a deleterious effect upon any of the constituent elements of critical habitat which are necessary to the survival or recovery of such species, and such effect is likely to result in a decline in the numbers of the species.

a. Constituent elements of critical habitat include, but are not limited to land, air, and water area, physical structure and topography, flora, fauna, climate, human activity, and the quality and chemical content of soil, water, and air.

b. The requirements for survival or recovery of listed species include space for normal growth, movement or territorial behavior; nutritional requirements such as food, water, minerals; sites for breeding, reproduction, or rearing of offspring; cover shelter; or other biological, physical, or behaviorial requirements.

D. Application of section 7 to Existing Activities and Programs

1. In considering whether section 7 applies to actions in the planning, review, or implementation stage but not completed prior to December 28, 1973, Federal agencies should determine if the action is (1) one undertaken by a non-Federal entity but one in which the Federal presence and control may still be felt or a Federal decision remains to be made which would permit or prohibit a non-Federal entity to proceed with a project, or (2) one being undertaken by or on behalf of a Federal entity and substantial work remains to be done which would, independent of the effect of earlier work performed, in and of itself jeopardize the continued existence of a listed species or modify or destroy critical habitat of a listed species. If the Federal presence and control remains to be felt, the Federal decision remains to be made, or such work on a Federal project remains to be performed, then the requirements of section 7 should be satisfied.

2. The requirements of section 7 shall be applied to activities and programs of Federal agencies presently in progress and initiated on or after December 28, 1973, that could affect listed species or their habitats. The concerned Federal agency should request assistance and consultation on activities or programs begun after December 28, 1973 as contained in these guidelines.

II. Determination of Critical Habitat

A. General Requirements

1. It is the responsibility of the Secretary through the Director, FWS or NMFS, to make the final determination of critical habitat for the listed species or for amending or terminating such determinations. All determinations will be made using rulemaking procedures which include notifying the Governors of the affected States and publishing in the Federal Register all proposed and final determinations of critical habitat.

2. Upon finding that an emergency exists (e.g., an action is about to take place that will pose a significant risk to the well-being of a listed species by the destruction or adverse modification of its habitat), the FWS or the NMFS may make an Emergency Determination of Critical Habitat. The Emergency Determination will be published in the Federal Register and will remain in effect for a maximum of 120 days. A determination of critical habitat using the rulemaking procedures stated in section II.A.1 will be initiated during the 120-day period.

B. Procedures for Determining Critical Habitat

1. The FWS or the NMFS will seek consultation, as appropriate, with the affected States in which the listed species' habitat occurs.

2. Prior to publishing a proposed rulemaking determining critical habitat for a listed species in the Federal Register, the FWS or NMFS will request information, assistance, and recommendations from Federal agencies with jurisdiction over lands, under consideration for such determination. The request will be in writing to such Federal agencies asking that they provide the FWS or NMFS with substantive comments and recommendations, based upon their biological expertise, on the habitat under consideration and how that habitat satisfies and fulfills the constituent elements of critical habitat enumerated in section I.C.3.a. of these guidelines.

3. After reviewing and incorporating, to the extent possible, the comments and recommendations of such agencies, and prior to publishing a proposed rulemaking in the Federal Register the FWS or NMFS will write the Federal agencies contacted under II.B.2 and notify them of the proposed critical habitat determination and the reasons for it. Following such notification, the FWS or NMFS will publish the proposed determination in the Federal Register.

III. Consultation and Assistance

A. Criteria for Determining the Need for Consultation and Assistance

1. It is the obligation and responsibility of Federal agencies using in-house expertise or other suitable sources to analyze and review (screen) their activities and programs in light of the "working" concepts discussed in I.C., to ascertain if listed species or their habitats will be affected beneficially or detrimentally. If a Federal agency judges that listed species or their habitats will not be affected by agency actions, the requirements of section 7 will not apply. If it is considered likely that listed species or their habitats could be affected, or if the Federal agencies or their authorized representatives desire the assistance of the FWS or the NMFS in determining the effects of their actions, then the consultation process shall be carried out as contained in these guidelines.

2. Informal consultation can and should be initiated at the field level between the FWS, or the NMFS and the Federal agencies or their authorized representatives (e.g., contractors, researchers, etc). In most cases, this will be a continuation of field coordination and cooperation that has been established in the past. This level of communication will be particularly useful for obtaining information on listed species or their habitats or clarifying the consultation process. It may also assist the Federal agencies in confirming their analysis or judgment of beneficial or detrimental effects that could result from their planned action on listed species or their habitat. Such consultation is supplemental to and not a substitute for, the formal consultation process described in these guidelines.

B. Initiation of the Consultation and Assistance Process

1. Consultation should be requested by Federal agencies as early as possible during activity or program planning and evaluation of alternatives. Such consultation may disclose conflicts between the activity or program, or proposed alternatives, and listed species considerations. Such disclosure could prompt an early modification of the activity or program or dismissal of alternatives by the Federal agency resulting in a saving of time, manpower, and money which would otherwise be expended by further evaluation.

2. When a Federal agency, using the criteria presented in part III. A. of these guidelines, determines that consultation with the FWS or NMFS should be undertaken, it should forward its written request for consultation to the FWS or the NMFS Regional Director for the Region or high seas in which the activity or program will occur. For activities or programs involving foreign countries, consultation should be requested from the Director, FWS or NMFS. Where Federal funds are used in an activity or program but the action will be carried out by a non-Federal entity, the funding agency should initiate the consultation process.

3. The FWS or the NMFS may from time to time, become aware of a Federal agency planning or conducting an activity or program that could affect listed species or their habitats that has not received the benefit of the consultation process. When this situation exists, the Regional Director or Director, FWS or NMFS, will promptly notify the Federal agency stating the nature of the action, and requesting that the consultation process be initiated.

C. Consultation and Assistance Process

1. While the burden is on the Federal agencies to collect information and conduct studies, take required actions to insure that their

activities or programs will not jeopardize the continued existence of listed species or destroy or adversely modify their critical habitats, the FWS or the NMFS will, to the extent they are able, assist Federal agencies upon request by providing (1) such data and reports as they possess, (2) manpower and resources for the collection of necessary biological data and the conduct of required studies, and (3) recommendations for necessary additional data, studies or surveys, suitable alternatives or methods for modification of the proposed action to insure compliance with section 7.

2. Consultation under the Act may be consolidated with other required consultation procedures such as the Fish and Wildlife Coordination Act, National Environmental Policy Act, or other agreed upon procedures. Satisfying the requirements of NEPA, the Fish and Wildlife Coordination Act, or other procedures or laws, may substantially satisfy the consultation process if satisfying such other laws includes the consultation procedures set forth in these guidelines. Federal agencies should keep in mind, however, that satisfying the requirement of such other laws will not relieve them of the obligation to insure that actions authorized, funded, or carried out by them do not jeopardize the continued existence of a listed species or modify or destroy critical habitat of a listed species.

3. Following the request for consultation from the Federal agency the Regional Director or Director of FWS or NMFS may arrange for a "threshold examination" of the area in which the activity or program is proposed to be carried out. A threshold examination may consist of an on-site inspection of the area and/or a review of available information to make a preliminary assessment as to whether listed species or their habitats will be impacted.

4. The FWS or the NMFS may seek, as appropriate, the assistance of the affected State or foreign country, the Federal agency, Universities, recovery teams, private conservation groups, et al., in conducting the threshold examination.

5. If the Regional Director or Director is of the opinion, as a result of the threshold examination of the activity or program, that in no likelihood, will (1) the continued existence of a listed species be jeopardized, (2) the area to be impacted by the activity or program be determined by further examination to be critical habitat, or (3) the activity or program results in the destruction or modification of habitat, previously determined to be critical by the Secretary, through the Director, the Federal agency will be so notified in writing and further consultation will be unnecessary.

6. If the Regional Director or Director as a result of the threshold examination is of the opinion that the activity or program may result in jeopardizing the continued existence of listed species or the destruction or adverse modification of previously determined critical habitat, he will so notify the Federal agency, in writing and a time frame in which the consultation process should be completed will be established in agreement with the Federal agency. The Federal agency with the assistance of the FWS or the NMFS, state, private, or other sources of expertise, as appropriate, shall then initiate appropriate surveys, studies, research and other means to obtain data and information relative to the impacts of the activity or program on listed species or their habitats. The data and information will be used by the Regional Director or Director in rendering his final biological opinions and, if requested, recommendations necessary to assist the Federal agency in meeting its obligation to insure that actions authorized, funded, or carried out by it do not jeopardize the continued existence of a listed species or modify or destroy critical habitat of a listed species.

7. If the Regional Director or Director as a result of the threshold examination is of the opinion that the activity or program will destroy or modify habitat that may be essential to the survival or recovery of listed species but which has not previously been determined to be critical, he shall so notify the Federal agency, in writing, and promptly initiate procedures described in II.A. and II.B. of the guidelines to determine if the area is critical habitat.

8. Cases may arise in the consultation and assistance process with the Regional Director that, in the opinion of the Regional Director, require the final Biological opinion of the Director, FWS or NMFS. Should this become necessary, he will notify the Federal agency and forward all relevant correspondence and background material to the Director. The Director, after appropriate review and consultation with the Federal agency and other appropriate sources, will notify the agency of the final biological opinions and recommendations of the FWS or the NMFS.

D. Completion of the Consultation and Assistance Process

1. The consultation and assistance process clearly should be reflected in a written record from its inception to completion. Where the consultation requirements or procedures related to other laws or procedures, such as NEPA and the Fish and Wildlife Coordination Act, have been used to facilitate the consultation and assistance process described in these guidelines, information relating to affected listed species and their habitats and the consultation process under these guidelines should be reflected clearly in the final documents required by these other laws (e.g., Environmental Impact Statement, environmental analyses, or assessments, Fish and Wildlife Report, etc.)

2. Consultation and assistance referred to in section 7 will have been completed when the Regional Director or Director, FWS or NMFS, has notified, in writing, the Federal agency, whose activity or program could impact listed species and/or its habitat, of the final biological opinions and, if requested by the Federal agency, recommendations of the FWS or NMFS. Such biological opinions and recommendations shall be accompanied by a statement of the reasons and biological evidence, including appropriate documentation, contributing, to his opinions and recommendations. Upon receipt of the biological opinions and recommendations of the FWS or the NMFS, it will be the prerogative and responsibility of the Federal agency to determine the final course of action that it will follow in light of its statutory requirements.

If, after completion of the consultation process, the initiating Federal agency (1) acquires new data revealing impacts to listed species or their habitats not previously considered, (2) substantially modifies its initial activity or program which could affect listed species or their habitats in a manner not previously considered by that agency in the consultation process, or (3) a new species is listed that would be affected by the activity or program, the agency should redetermine the need for consultation with the FWS or NMFS.

[EXHIBIT 46]

Search for Snail Darter

Watercourses

Buffalo River

Clinch River

Duck River

Elk River

Emory River

Obed River

Daddy's Creek

French Broad River

Kneelas Creek

Limestone Creek

Nolichucky River

Little Pigeon River

Hiwassee River (does not include activities associated with the transplanted population)

Ocoee River

Toccoa River

Holston River

South Holston River

Watauga River

Woods Creek

Watercourses

Little Tennessee River (includes sites above US 411 bridge only)

Tellico River

Fork Creek

Prong Creek

Bat Creek

Airheart Creek

First Creek

Citico Creek

Nineмile Creek

Baker Creek

Little River

Powell River

Sequatchie River

Little Sequatchie River

Big Brush Creek

Tennessee River

Piney Creek (Ala.)

Piney Spring Branch (Ala.)

Round Island Creek (Ala.)

Swan Creek (Ala.)

Blair Spring Branch (Ala.)

Privy Spring (Ala.)

Sixmile Creek (Ala.)

Cotaco Creek (Ala.)

Indian Creek (Ala.)

Brush Creek (Ala.)

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Watercourses

Tennessee River (cont.)

Bluewater Creek (Ala.)

Paint Rock Creek

White Creek

Piney River

Stock Creek

has been any effective reproduction in the snail darter in the transplant area?

A. The evidence we have so far doesn't indicate to the contrary.

Q. Does it indicate that there has been any reproduction?

A. Yes, it does.

Q. And in what way does it indicate that there has been any reproduction?

A. Earlier looks at these fish revealed males which were flowing milt and females which were large and heavy with eggs; and then as time progressed, the eggs became flowing, and as time progressed even further, then we started finding females that were empty and males that were somewhat slimmer than they had been, and you could not get milt out of them anymore. And we noted these same conditions paralleling these in the Little Tennessee River populations.

Q. And did you observe, well, let's put it this way. How do you know that any of these females that you observed that were, say, had eggs within them or were later spent, were the same specimens of the snail darter?

A. Well, I don't know that they were the same specimens.

Q. Okay, so you really have no direct evidence, do you, that there has been any effective [77] reproduction in the Hiwassee River?

A. As far as I'm concerned, my opinion is that there has been, the reproductive act has been.

Q. Has there been any, let's say, any young fish born, so to speak, or hatched, of the snail darter that you are aware of? Let me put it this way. Would you not consider it an essential aspect of successful reproduction, not only the reproductive act between the male and the female, but the hatching of the eggs resulting in the production of offspring?

A. Yes, in order to be completely successful, why, the whole thing has to occur.

Q. And have you observed any hatching of offspring to indicate that there has been successful reproduction in the Hiwassee River?

A. We have not observed it in the Hiwassee or the Little Tennessee.

Q. All right. And it is then fair to state, is it not, that you have not observed, nor can you document or prove the complete reproductive process in the Hiwassee River?

A. Not entirely. We have been taking what we call Icthyo Plankton samples in the Hiwassee and the Little Tennessee River, which is merely setting fine mesh nets in the river that stuff that is perhaps drifting in the water or [78] stuff that we may kick up ahead of the net goes into the net and gets caught. And we haven't analyzed and sorted out all the samples yet, but in one sample from the Hiwassee River, there were two eggs taken that were what the larval fish people call late embryonic eggs that they could——

[Thereupon, a short conversation was held off the record.]

A. I believe I was saying that two eggs had been found in one sample from the Hiwassee River that were in late embryonic development and our larval fish people in our laboratory can definitely identify that these are in the Percid family, that the eggs are from a Percid fish.

Q. The genus——

A. From the perch family.

Q. All right.

A. Now, we, in all of our observations and looking in both rivers have only found one other Percid fish that is spawning or was spawning at the same time; and that was a fish that occurs only in the Little Tennessee. So based upon this——

Q. And what was that fish?

A. That was the river darter, Percina Shumardi. We had not seen this species in the Hiwassee River, and I'm confident that it's not there.

Q. Isn't it a fact that the Percina Shumardi, [79] as I understood it was pronounced, is the darter within the subgenus Imostoma which exhibits the most tolerance not only to turbidity, but to water depth?

A. I do not know whether that's a fact or not.

Q. You don't have sufficient information or evidence to contradict that or to agree with it.

A. I haven't examined any evidence. I don't know whether I have it or not.

Q. But these Ichthyo Plankton you referred to, even the larval fish people can not agree nor make any determination that this is, so to speak, the snail darter.

A. They can not say that it is the snail darter.

Q. So you could not make any statement with any reasonable scientific certainty that at this point in time, there is any positive, direct evidence that the snail darter or darters that have been transplanted in the Hiwassee River have engaged in the complete reproductive process, resulting in offspring.

A. I would be willing to state an opinion that they had, yes.

Q. And based on what direct, positive scientific evidence?

A. Based upon the fact that we have not seen any other fish in the perch family in the Hiwassee River that [80] have shown any indications of either spawning or being ready to spawn.

Q. And of course, at this point, you don't know really whether or not there are any Percina Shumardi in the Hiwassee River or not.

A. I'm reasonably confident there aren't.

Q. Have you made any searches for it?

A. No, not specifically for Shumardi, but we have done a number of fish samples in that river on other projects in which all fish were collected and identified.

Q. Is the basis for that opinion predicated upon the finding of these two Ichthyo Plankton or these in the embryonic stage?

A. The basis for that opinion is predicated upon that fact and the fact that the fish were developing in apparently normal fashion toward spawning, the spawning period, and showed what we felt was evidence that they had carried out the act by not finding any females that were full of eggs and finding females that in our opinion appeared to be spent.

Q. But in terms of your investigation of the transplanting process in the Hiwassee River, you have not found any direct positive evidence that there have been any offspring actually produced or hatched.

A. No, I have not found any that could be [81] definitely identified as snail darters.

Q. And would you not agree that it was not a factual statement that definitively at this time, from a scientific point of view, the snail darter was reproducing in the Hiwassee River,

that it was not a scientific, proper scientific conclusion that the snail darter was reproducing in the Hiwassee River?

A. I wouldn't agree to that because a lot of scientific investigations and so forth are based on deductive reasoning and do not necessarily always have hard facts to arrive at a conclusion or an opinion.

Q. And on how many occasions have the observations been made of the females being spent and prior thereto, the females being——

A. I do not know how many times.

Q. Has this been documented?

A. I believe it has.

Q. And are these in the field notes or the two week summaries that you referred to?

A. Yes.

Q. Are the larvae that you referred to in the embryonic stage, are they available for scientific investigation?

A. As far as I know, yes.

Q. Are they at your laboratory in Norris?

[10]

really, is a small area. All the information that I have ever gathered is that darters in general inhabit small home ranges, I guess you could call it. They go from riffle to pool, just one riffle and one pool, and so forth, and they don't migrate for several miles, and so forth, to spawn.

Q. Upon what do you base that?

A. Well, my experience with darters.

Q. Would you not agree, for example, that some of the snail darters that have been found in the area below the Little Tennessee River, specifically in the area within a thousand feet of the mouth of the Little Tennesssee and four miles downstream or ten miles downstream may be a particular species of the snail darter that initially were in the Little Tennessee but by current or otherwise have swan to those particular points?

A. No. No, sir, I don't feel that they have come from the Little T, if that's what you mean.

Q. What evidence do you have that they have not done so?

A. Well, they're thriving down there. They have the same type of substrate, or suitable substrate.

Q. What evidence do you have that they're thriving down there?

A. Well, they're living.

Q. Does that necessarily mean that they're [11] thriving?

A. Well, I would assume that if they are living down there and there are several age groups there, that it does appear that they are.

Q. Are you aware of the fact that the two specimens that were actually collected below the mouth of the Little Tennessee River in Watts Bar, I believe one of them in the area of a thousand feet below the mouth of the Little Tennessee and another one four miles below the dam, that those two specimens upon dissection indicated that they were nutritionally in somewhat deficient condition?

A. Well, I've heard this right out, but in my opinion these fish appeared just as healthy and in as good condition as the fish in the Little T.

Q. On what do you base that?

A. Well, just from observing several—well, probably two thousand specimens of snail darters in the Little T.

Q. You've seen about two thousand specimens of snail darter in the Little T?

A. Well, yes, that's a rough estimate.

Q. And how many have you actually observed below the mouth of the Little Tennessee River in the Watts Bar Reservoir?

A. Oh, somewhere around a hundred.

[12] Q. You have observed a hundred yourself?

A. Yes, sir.

Q. I'm excluding Hiawassee, now. I'm talking about in the area of the Little Tennessee River below the confluence of the Little Tennessee and Watts Bar Reservoir.

A. Well, I'm saying I've seen approximately a hundred snail darters in what's called Watts Bar Reservoir.

Q. And when did you observe those snail darter specimen?

A. Well, we first observed them down there in September, last September.

Q. 1975?

A. 1975.

Q. And to what extent have you actually collected any of those specimens that you observed in the Watts Bar Reservoir

other than the two that have been turned over to Wayne Starner?

A. Those are the only two we have collected.

Q. And where did you observe these hundred specimens?

A. Well, we observed approximately—

Q. I'm talking about you, yourself, personally.

A. Yes. Well, you mean the only ones that I have seen.

[13] Q. I'm talking about you, yourself, Gary Hickman.

A. Right. OK, I've seen probably eighty of these down below Little T, up against the Tellico Dam, in that area of Watts Bar.

Q. All right, would it be fair to say that those eighty that you observed were almost in the immediate area of the confluence of the Watts Bar and the mouth of the Little Tennessee River?

A. Would you repeat that again.

Q. Would it not be fair to state that eighty of those hundred that you have observed were almost immediately in the area of the confluence of the Little Tennessee River, mouth of the Little Tennessee River and the Watts Bar Reservoir, where the two join?

A. Well, they were down below the Tellico Dam.

Q. That's not what I asked you. Is it not fair to state that those eighty that you observed were almost immediately in the area where the two bodies of water, the Little Tennessee River and the Watts Bar Reservoir, meet?

A. Well, it's—that immediate area is Watts Bar Reservoir, anything down below Tellico Dam.

Q. I understand that, but that is in there where the two bodies of water meet.

[14] A. Well, right, Tellico Reservoir.

Q. All right, and you have not observed any of those eighty species of snail darters at a distance, other than the ones at four miles and ten miles downstream, beyond a distance of a thousand feet below the confluence of the Watts Bar and the Little Tennessee River?

A. Right.

Q. Is that a fair statement?

A. Would you repeat it again? I'm sorry.

Q. And it is fair to state that except for the specimens you observed four miles downstream and ten miles downstream,

that all of the eighty specimens that you have observed have not been a distance below the confluence of the Watts Bar Reservoir and the Little Tennessee River, more than one thousand feet? And I'm using your own estimate that Mr. Saylor gave us.

A. Well, I consider anything below Tellico Dam as Watts Bar Reservoir. So those that were down, what you're calling a thousand feet down from the mouth of the Little T were really further than that down from Tellico Dam.

Q. Well, Tellico Dam itself is somewhat above the actual confluence of the Watts Bar Reservoir and the Little Tennessee River, is it not?

A. Well, no. Tellico Dam, anything below Tellico Dam is Watts Bar Reservoir.

[15] Q. Well, at this point, at some point in the future that's the case, but in terms of the actual confluence of the two bodies of water at this point in time, the actual construction of the Tellico Dam itself is somewhat upstream of that precise location?

A. Well, it's upstream of where——

Q. Little Tennessee goes into Watts Bar Reservoir.

A. Well, I can't say that because, you know, on the map it says that's Watts Bar Reservoir.

Q. I don't care what it says on the map. I'm talking about in terms of the actual confluence of the two bodies of water as you would observe them.

A. Well, the confluence is the dam.

Q. I'm talking about the confluence is the actual joining and meeting of the two bodies of water, assuming the dam is not even there.

Mr. Wagner. Let's go off the record just a minute. I think something is important here, Boone, that I don't think you understand.

[Thereupon, a short conversation was held off the record.]

Q. Do you understand what I'm talking about?

A. Well, now, that they have clarified it, I [16] understand that the old Little T and Tennessee River, where they met, yes, I understand that. But as far as Little T and Watts Bar well, that is Watts Bar right below the dam there is what I'm trying to——

Q. But the point I'm making, and I'm not trying to trick you, I'm just trying to clear this up in terms of actual observations.

A. Yes.

Q. As far as eighty of the hundred specimens of snail darter that you say you have observed, they have been within one thousand feet, in the area within one thousand feet or closer to the confluence of Watts Bar Reservoir and the Little Tennessee River; is that not a fair statement?

A. Well, you're back to the same Watts Bar thing. The confluence of what the old Little T and the old Tennessee River was before there was a reservoir.

Q. All right.

A. But since the reservoir is there, you know, that's Watts Bar.

Q. Well, where would it be in terms of the confluence of the old Little T and the Tennessee River?

A. Well, Okay. That would be about approximately—Now, you're asking the question of how many have we seen down below that?

Q. Or in that area.

[17] A. Or in that area. Besides the eighty?

Q. No, I'm talking——

A. Eighty is just an approximate—it probably might not be exactly right. There would be—we saw—There was three right there downstream where the old Tennessee River confluence is.

Q. Now, are some of the snail darters you're counting in the calculation of a hundred, or approximately one hundred, were some of them observed in the location where you designate that as somewhere around River Mile .2 or .3, at a depth of twenty-seven feet?

A. Yes, sir.

Q. All right. Now, you really, in terms of your own designation, still consider that part of the Little Tennessee River; in fact, designated as River Mile .2 or .3 of the Little Tennessee River, do you not?

A. Well, we did at that time, yes.

Q. But in terms of actually in the area of the Watts Bar Reservoir, in the area of the dam, or let's say below the dam, within, let's say, a thousand feet from the Watts Bar Reservoir, as Mr. Saylor indicates to us, you have observed three specimens?

A. Yes. It was a little further down than that where the last specimen was found.

Q. Well, Mr. Saylor gave us the estimate of [18] a thousand feet. What do you say?

A. Well, I'd say the first two were approximately a thousand feet downstream and then we went another four hundred foot in and probably dove four hundred feet again. So it would be another eight hundred feet. My estimate was about fifteen hundred, but it could be a little further down than that.

Q. Okay. And then how many have you observed at four miles downstream?

A. Just one.

Q. And how many have you observed at ten miles below?

A. I haven't observed any at ten miles.

Q. And how many have you been advised?

A. Four.

Q. Four. At four miles downstream you have just observed one?

A. Yes, sir.

Q. And that one was collected?

A. Yes, sir.

Q. So, it is fair to state that in the area of the Watts Bar Reservoir itself you have observed, or your group has observed four snail darters at an area ten miles downstream, one at four miles downstream, and three in the area of fifteen hundred feet, to some area closer to the [19] confluence of the Watts Bar and the Little Tennessee River. Fair statement?

A. Well, no. All until that last part, confluence of the Old Tennessee——

Q. Okay. I'm not trying to be fancy with you. Let's be a little more precise.

A. I know.

Q. As I understand it, you found one specimen somewhere in the area of approximately fifteen hundred feet below the dam in the Watts Bar Reservoir. Is that approximately correct?

A. No. It would have been further than that below the dam. This was fifteen hundred feet below the old confluence of the Little T and Tennessee Rivers.

Q. Okay. Then in the approximate area of the area of the Little Tennessee and the Watts Bar Reservoir, that is the old confluence, you observed two more specimens?

A. Yeah, in the confluence of the old Tennessee, right.

Q. And what we're saying is that the old confluence of the Little Tennessee and the Watts Bar Reservoir, there is somewhat of a dispersal of the gravel type substrate in that area at a depth of probably eight to twelve feet?

A. Well, that's—first thing is when you say the old Little T and Watts Bar, there wasn't a Watts Bar.

[20] Q. Tennessee River.

A. Right. Okay, yes, it had—Now, what was your question? The substrate was——

Q. Okay, let me back up. At the area approximately fifteen hundred feet or a little bit further below the dam, you observed one specimen and that specimen was collected?

A. Well, it wasn't below the dam. It was below the confluence.

Q. Okay. Below the old confluence?

A. Right.

Q. Okay. Then in the area of the old confluence itself, you observed two more specimens?

A. Well, yeah, a thousand feet below.

Q. A thousand feet below? Now, are you sure about that?

A. It was about a thousand feet.

Q. Have you seen the little drawings that were prepared and introduced as exhibits?

A. Yes, I've seen them.

Q. Were you involved in the preparation of those?

A. I made it, yes.

Q. You made it?

A. Yes.

[21] Q. You would not agree with Mr. Saylor's estimation that the—who actually made the collection of that?

A. I think Charlie actually grabbed the fish. I think Charlie had said that I had, but that was—Charlie actually grabbed the fish. He and I got together with our hands down there and he actually caught the fish, yes.

Q. Now, was that the one in the area of the fifteen hundred foot location?

A. No, this was the thousand foot location.

Q. Okay. Which you indicate would be in the approximate area of the old confluence of the Little Tennessee River and the Tennessee River?

A. Right. Well, it would be a thousand feet downstream from that.

Q. Okay. Now, is it fair to state that below the dam itself—Well, let's be a little more precise.

[Thereupon, a short conversation was held off the record.]

Q. At the point where you designated River Mile .2 or River Mile .3 of the Little Tennessee River, where a photograph was taken at approximately twenty-seven feet, that is the location where you observed the primary number of darters that you have referred to?

[22] A. Well, it took place from that spot downstream to the confluence, the old confluence.

Q. All right.

A. Most of them, yes.

Q. And that is approximately the eighty, or considerably more than you refer to, correct?

A. Considerably more than we have—Of course, we looked more there also.

Q. Okay. And were those eighty or more observed in one series of dives on one day or was it over a several day period?

A. It was over a several day period.

Q. Is that depth of twenty-seven feet the natural depth that had been existing in that precise location for five years or more?

A. Well, I'm not sure of the exact date of when that Tellico Dam construction was put there.

Q. You're talking about the Chilhowee Dam or the Tellico Dam structure?

A. The Tellico Dam structure. I don't know the exact date of when that was put in.

Q. Are you talking about the cofferdam or the——

A. No, the other dam, the main dam.

Q. The main dam itself?

[23] A. Yes, sir.

Q. Has it affected the depth in that particular area where you observed the snail darters at twenty-seven feet?

A. I really don't know. I don't have that information.

Q. So, it is fair to state that in the area where you observed the snail darters, as you designate, at River Mile .2 or River Mile .3, you do not know whether that was the natural depth in that location of the Little Tennessee River for any period

of time prior to the construction of the Tellico Dam structure itself?

A. I don't know that.

Q. Now, as I understand it then, other than the eighty or more that you have observed in that area of the dam, and a little bit above and a little bit below, the only ones you've actually observed in the Watts Bar Reservoir are the three in the area of the confluence down to approximately fifteen hundred feet, one at four miles downstream and four more at ten miles downstream?

A. No, sir, because all of those, the approximately eighty or so were also in the Watts Bar Reservoir.

Q. But you designate that as River Mile .2 or River Mile .3 of the Little Tennessee River.

[24] A. Well, we had earlier, but that was a mistake.

Q. What resulted in that earlier designation of that location?

A. Well, I don't know if I made that designation or if Charlie did, but we just made it.

Q. Well, you evidently considered it to be within the confines of the Little Tennessee River, did you not?

A. We did at that time.

Q. All right, who prompted you to make a change in that designation?

A. Well, we got to looking at the maps on Watts Bar Reservoir, thinking of going downstream and looking for these things and we saw that this was actually part of Watts Bar Reservoir instead of the Little Tennessee River.

Q. Well, part of Watts Bar Reservoir as indicated on the map?

A. Well, and also as it—well, I have been told [illegible] brought up that the depth, you know, part of Watts Bar has backed up the water up in the——

Q. Is that what you're basing the designation on primarily, that the Watts Bar Reservoir has increased the depth of the area of the Little Tennessee?

A. Well, water backs up in there, yes.

[25] Q. Is that what that's based on primarily?

A. You mean why we call it Watts Bar Reservoir?

Q. Yes.

A. Yes, that's why most reservoirs are called reservoirs, because water is backed up.

Q. As far as the actual physical location, is there not an area where there was a natural opening as far as the Little Tennessee going into the area of the Tennessee River somewhat below the actual dam structure and below the Fort Loudon Dam area?

A. Yes, there was an area where it did, the Little Tennessee——

Q. And that's the confluence that we've been talking about?

A. That's the old confluence, right.

Q. And if you use the old confluence as your starting point, the area where you found the, let's say, eighty or more snail darters would be upstream in the Little Tennessee River at the approximate River Mile .2 or .3, as you originally designated?

A. Well, if these had been found prior to Watts Bar Reservoir, yes. But since the reservoir is there now, it has to be considered Watts Bar.

Q. Well, that's somewhat of a technical designation, is it not?

[26] A. Well, the water has backed up, so it is Watts Bar Reservoir.

Q. Of course, in any confluence of a reservoir with a stream or river running into that reservoir, there's going to be some backing up of that reservoir into the river where they join; is that not true?

A. Right.

Q. OK. So if you consider the old confluence of the Little Tennessee and the Tennessee River, all you have found below that point in the Watts Bar Reservoir have been the three specimens in the area of the confluence down to about fifteen hundred feet, one at four miles and the four at ten miles downstream?

A. If you're just talking about from that specific point downstream, yes, that's true.

Q. Have you found the snail darter in any other body of water, other than the ones that we've talked about in the Watts Bar Reservoir or in the Little Tennessee River itself or in the transplant area in the Hiwassee River?

A. No, sir.

Q. In fact, you have not even been able to find any of the specimens which were transplanted in the Nolichucky?

A. Well we've only looked, gone back and inspected that area of the Nolichucky with the same crew only [27] one time and our major objective—well, part of our objective was to find snail darters, if they had, but another part was the program on the sharp-head darter.

Q. And what's the name of the sharp-head darter?

A. Acuticeps.

Q. How many times have you been involved in the collection of the snail darter in the Little Tennessee River itself? Give me just an approximate number. I'm talking about, let's say, from River Mile .5 up to River Mile 17.

A. From River Mile .5.

Q. To River Mile 17 at Davis Island.

A. How many times have I been involved?

Q. Approximately.

A. It would be hard to put a number on it. I would say a hundred.

Q. All right. And would you agree that since approximately June or July of 1975, the project crew of which you are a member and which Dick Fitz is the project leader of, have been working basically fulltime on the snail darter program?

A. I have not been working since June fulltime on the snail darter, and neither has Dick, I don't believe.

[28] Q. All right, since when have you been working on it fulltime?

A. I believe I came onto the project in September.

Q. Of 1975?

A. Of 1975, yes.

Q. Have you been able to find any specimens of the snail darter above River Mile 17 in the Little Tennessee River, from there up to the Chilhowee Dam?

A. No, sir, we haven't found any. However, we've only looked—Well, in my experience alone, I've only been up there one other time up above that.

Q. All right, have you been present on each occasion when representatives of TVA have found specimens of the snail darter between River Mile 17 and River Mile .5?

A. No, not each occasion.

Q. Do you have any opinion as to whether the habitat area for the snail darter is present above River Mile 17, from there to Chilhowee Dam?

A. There are areas of suitable habitat, substrate types, yes, sir.

Q. And would you say they're somewhat limited as compared to the area below River Mile 17?

A. There are smaller areas; there aren't as much of that same substrate, right.

[29] Q. How would you say that the areas where you found the snail darter in the Watts Bar Reservoir, and I'm talking specifically of the three specimens below the confluence, and the one at four miles and the one at ten miles, how would you say the bottom areas or substrate areas would compare with the Little Tennessee River at, say, Coytee Springs?

A. Well, I'd say they compared quite favorably, really. They looked very similar. They did have a little bit more silt covering, but they did look very, very similar.

Q. And in what way were they similar? Could you just give us a little more definitive description?

A. Well, they had large areas of the sandy, gravel substrate, which is what you find in the Little Tennessee River.

Q. If you were describing to a layman what a sandy, gravel substrate looked like, how would you describe it?

A. Well, you'd say small stones, approximately an inch, from an inch to two inches in diameter, or across, and then sand. Sand intermixed with the gravel.

Q. All right, and in the area of Coytee Springs would you say that this sandy, gravel substrate was almost totally void of silt?

[30] A. No. It's got silt.

Q. And to what degree would you say it has silt?

A. Well, it's probably a relatively small percent of the total composition of gravel and sand, but there is silt.

Q. Well, let's say in an area of twelve feet square in, say, Coytee Springs, approximately what percent would you say would have some silt deposition?

A. Well, there will be silt mixed in all of it. As to the percent of silt that is in that particular area is different if it's in a riffle area, or if it's in a backwater area, or a slower pool situation, or the really fast shoots.

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Q. Well, could you give me some comparison with regard to the areas you mentioned?

A. Well, like the fast shoots are going to, you know, just have very small percents in them of silt, maybe two percent or something like that, where your——

Q. All right, how about a pool, riffle or backwater?

A. Okay, your pool is going to have—well, it would kind of differ on a pool and how much flow you have. The pool could have, you know, up to ten percent, and the backwaters the same way.

[31] Q. Would you say that the areas of the Little Tennessee River, let's say, like Coytee Springs would not have any sort of silt deposition, if we took an example of area of approximately twelve feet, even in the different areas that you refer to, that ten percent would probably be the limit?

A. Yes, I'd say ten percent would be—well, unless you got towards the banks, you know, where it's really—you can get large deposits of silt there.

Q. And have you noticed more silt in the areas along the bank since the clearing of the bank areas by the TVA crews?

A. Well, I don't think it's any noticeable—There are certain areas where little creeks come in that it has may be increased some, but as far as large scale along the banks, no.

Q. You haven't noticed some silt deposition, more than there was prior to the clearing, say, coming from the bank out maybe ten to twenty feet from the bank on either side?

A. Well, they've only been doing it on one side. The other side is relatively—well, it hasn't been tampered with and your silt deposition is not much different on either, you know, one bank from the other.

Q. Have you made any significant analysis or [32] observation with regard to the silt deposition, if any?

A. No. This is not our part.

Q. OK. You're not a silt man?

A. No, right.

Q. All right, now, when you go down to the substrate areas in the Watts Bar Reservoir, let's say in the area of the fifteen hundred foot location, four miles downstream, and the ten miles downstream, how would you compare those substrate areas, let's say, as far as the silt deposition compared with the Coytee Springs area?

A. Well, there is a slightly higher amount of silt there.

Q. All right, and would you say it's more sort of a muddy silt deposition, slimy bottom material?

A. No, no, it's just a slight silt coating. You can just—that's all it is, you can just flick your hand and, you know, brush it off.

Q. OK. And if you again, let's say, took a twelve foot square area and sort of compared it at the three locations in Watts Bar, what percent of silt deposition would you give for those areas?

A. Well, first off, I haven't been to the ten miles downstream site.

Q. You haven't been in that area at all?

A. Right. So, I can't say what the silt is [33] there.

Q. OK. Let's apply the four mile location and the fifteen hundred foot location.

A. OK. Well, I'd say it's probably five percent as opposed to—five or six percent as opposed to two percent in the riffle areas in the Little T.

Q. OK. And does the silt in any way vary or differ in composition in the substrate areas in the Watts Bar Reservoir as opposed to the riffle areas in the Little Tennessee River?

A. Well, like I say, I'm no expert on silt, but it doesn't appear to. It just appears to be a light coating of small particles of silt. But as far as different composition, no, I couldn't tell that there is any difference.

Q. From what you have observed—Well, let me ask you this. Have you yourself observed or engaged in any reproductive studies with regard to the snail darter?

A. Well, we've attempted to observe the fish in the river spawning and we have noted some activities, but we have not seen the actual spawning take place.

Q. Now, where have you observed the activity you refer to?

A. Well, this was in the Coytee Spring and Tolliver Island area.

Q. Pardon me?

[34] A. Coytee Spring area and in the Tolliver Island area.

Q. And where is the Tolliver Island area?

A. Well, it's about half a mile up above the Coytee Spring area.

Q. In the Little Tennessee River?

A. In the Little Tennessee.

Q. All right, what have you actually observed with regard to something relating to reproductive activity, or a part of it, in the Little Tennessee River?

A. Well, we observed——

Q. Now, who is "we"?

A. OK, the crew, the dive crew.

Q. Have you, yourself observed this?

A. Yes, I've observed it. One individual male dove under a rock and dug it out. It was a fairly large rock; say, it was approximately four or five inches across, and it was sitting in a way to the current where it would create a small pocket of sand behind it, and he proceeded to dig into this and kind of clear this out, and then after he had done it, he left. But this is—we don't know that this is a spawning thing, but other divers at this same period of time saw this activity and we hadn't seen it in any of our other observations. We thought possibly this might be.

[35] Q. In what way do you possibly consider that to be part of the spawning activities?

A. Well, the male creating a place to deposit the eggs.

Q. All right. Have you actually observed any aggregates of male-females in the Little Tennessee River as sort of a preparatory to spawning activity or what you considered spawning activity?

A. Well, we have observed groups of males. You know, you'll go in and you'll seine or you'll look in an area and you'll see large groups of males and no females. But these were widely separated groups and even in different beds of water, and so forth, so we couldn't really separate, you know, say that they were going to spawn right here or something like that.

Q. But there was some, maybe, indication that that was possibly about to occur, from your observations?

A. Yes, that the spawning was getting close, plus the fact that the females we did pick up were free-flowing.

Q. OK. Have you observed any similar activity in the Hiawassee River where the transplants were?

A. Yes, the same sort of activities.

Q. And what sort of activity have you observed in this connection in the Hiawassee?

[36] A. Well, I'm speaking of the—I don't mean, we haven't seen the digging out under the rocks. I don't mean that

I mean we have seen the segregation of the males, and the females more or less disappearing from our collections for a period of time, and then the females that we do collect are free-flowing or were free-flowing then. They aren't now.

Q. From what I understand, there's been somewhere in the neighborhood of seven hundred and seventy snail darters placed in three locations in the Hiawassee River?

A. I don't think that's the actual number. I think it's seven hundred and ten.

Q. All right, seven hundred and ten?

A. Yes.

Q. And how many of those seven hundred and ten that have been placed in the Hiawassee River at three locations have you observed since that transplant?

A. I'd say we've probably observed approximately a hundred of them.

Q. And were all those in one location or all three locations?

A. Well, that's spread out over the three locations.

Q. And what is the distance of the three locations from each other?

[37] A. Well, I believe station one is abount a mile and a quarter from station two, and station two is about, or station three is about another mile downstream.

Q. So the transplant area is all within approximately three miles?

A. Right.

Q. Do you have any evidence whatsoever that the snail darter has engaged or has an ability to engage in reproductive, successful reproductive activity in the Watts Bar Reservoir?

A. Well, I think the—All I can go on is the appearance of this female we picked up at River Mile 4 compared to the appearance of those in the Coytee Spring area prior to and during spawning, and so forth. This fish appeared partially spent.

Q. As to whether the female may have deposited the eggs or not, you don't know?

A. Right. We don't know where she deposited them or for sure if she deposited them.

Q. And the only indication or evidence you have of any nature whatsoever with regard to successful reproduction activity, or any reproduction activity, is this one female which

you found at River Mile, or four miles downstream in the Watts Bar Reservoir which was partially spent?

A. No. Of course, this is what the crew has [38] told me. I wasn't at the ten mile station. But one age one fish was seen and one age two fish was seen and then two that they estimated to be age three or four fish. This is several age groups which suggest that they are carrying on reproduction.

Q. None of those fish were collected?

A. None of these were collected.

Q. And do you know why they were not collected?

A. Well, we were under orders not to collect anymore at that time.

Q. And who issued such orders?

A. Dick Fitz.

Q. Is there any reason why you were not present at the location ten miles downstream?

A. I was at a meeting in Washington.

Q. Was that with the Department of Interior?

A. No, this was a North American meeting.

Q. Are you a member of any professional societies or groups?

A. Yes, The American Fishery Society.

Q. Anything else?

A. I can't recall anything else right now, as far as professional societies, no.

Q. In terms of the transplant program, would [39] you say that you have more involvement and more information as far as that program than anyone else with TVA?

A. Well, I would say I have a large involvement in it, but I would say Dick Fitz and Charlie Saylor have just as large an involvement.

Q. Are you not possibly sort of in charge of the transplant program for TVA?

A. Well, no, not really. Dick is in charge of the whole program. He's in charge of the transplant and everything else. I'm just the field supervisor.

Q. But don't you have more field responsibility than anyone else as far as the transplant program?

A. Yes, as far as the field responsibility, yes.

Q. OK. Do you have an opinion as to whether or not the completion of the Tellico Dam and the resulting impoundment

and reservoir of the Little Tennessee River area will adversely affect the habitat of the snail darter; let's say, for example, Coytee Springs, first of all?

A. Do I think that the impoundment will affect——

Q. Adversely affect the habitat of the snail darter?

A. Well, it will put it under sixty feet of water or something like that and that would be adversely [40] affecting the habitat right there, yes.

Q. And would you agree, from what you know, let's take the Coytee Springs area, which I understand is River Mile 7, and would you agree that at River Mile 7, at Coytee Springs, that at this point in time the depth is probably two to three feet?

A. Well, yes. It gets a little deeper in areas.

Q. Give or take, but approximately that depth.

A. Well, yes, I think that the maximum depth is about ten feet in that area.

Q. And ranges in other areas of the Coytee Springs area down to two or three feet?

A. Oh, yes.

Q. Or even less?

A. At low flow, yes.

Q. Right. And recognizing the fact that Chilhowee Dam controls the flow and at different times of the day the flow is up and others it's down.

A. Right.

Q. But the range would be somewhere between two to three feet or less up to ten feet at maximum flow, or maximum discharge?

A. Well, at maximum discharge, I think the [41] least depth is probably about four feet. This is just what I think. I don't have the figures to know for sure. And the maximum depth would probably be up to around fifteen feet.

Q. All right. Would you not agree that the maximum discharge covers only relatively a small period of time in terms of the twenty-four hour period?

A. Well, no, I would say the maximum discharge covers probably the major portion of the time. It'll kind of depend on the time of the year, again.

Q. You don't have any specific evidence in that regard, do you?

A. Well, I do—say, in the winter, March, February, January, that part of the year, it is under large amounts of water, you know, greater depths a large portion of time because you've got your—well, it just is because of the power, and so forth, that they need.

Q. All right, and when the impoundment is created, the Tellico Dam is closed, you agree that the reservoir would be stable and, let's say, the area of Coytee Springs, let's say between River Pool 807 to 813, at a depth of somewhere between twenty to forty feet in that area, at least?

A. Yes, I believe that's true.

Q. OK. And that would be generally true in the reservoir itself, depending on the physical locations [42] and the various levels below Chilhowee Dam?

A. Well, it would be in the lower section. Now, in the upper section it's a different matter. It's going to be considerably shallower and have flow, and so forth up there.

Q. I'm talking about primarily River Mile 17 down to the Tellico Dam itself?

A. It'll be pretty deep. I don't know what the actual depth is.

Q. OK. Now, when you say that the creation of that reservoir and impoundment in your opinion would adversely affect the habitat, would you not agree that that adverse effect upon the snail darter habitat would probably, at least as a minimum, affect the numbers of snail darter population and decrease that snail darter population?

A. Well, I think it might decrease the population—It probably will decrease the population at the Coytee Spring area. However, they may move upstream and establish a large population up there in the areas of habitat up there.

Q. Well, you really have no evidence to indicate that such will occur?

A. Well, we do know that they have suitable substrate and have good water quality, and there's already darters up there now. And we know that the darter is down in [43] Watts Bar and everything, in my opinion——

Q. Which darter is that?

A. Snail darter.

Q. You say there's already snail darters above River Mile 17?

A. No. Oh, you mean—There's already darters up there, not snail darters, other species of darters.

Q. I'm talking about snail darters.

A. Well, we don't know right now if there are or not for sure.

Q. And what evidence do you have to communicate to you that the snail darter would attempt to move upstream to areas where the habitat that it requires might be available?

A. Well, just the fact that the area is there. There are going to be opportunists—I mean, if it gets bad down where they are residing now, I believe they will try and find another area which will be better.

Q. Would you not agree that the Coytee Springs area is a typical habitat of the snail darter insofar as you know of the snail darter habitat?

A. Well, we really—it's where probably the majority of the population is found that we know of to date. Now, further downstream in Watts Bar, and so forth, you know, that could be a good habitat, and there [44] apparently is good habitat for the fish also. But as far as numbers are concerned, so far it appears that Coytee Springs or the Little Tennessee River is the main population.

Q. In fact, your efforts to transplant the snail darter into the Hiwassee were in areas that most closely resemble the Coytee Springs area?

A. Right, right.

Q. So you would agree that you consider the most favorable habitat of the snail darter to be that area similar to Coytee Springs?

A. Well, I would say that we did consider this back when we were doing the transplanting but now that we have found these down in Watts Bar, we are, you know, taking a second look. That's why we're looking elsewhere now. Maybe this is a good habitat type for them.

Q. But do you have any scientific evidence to indicate that the areas in Watts Bar where you found the snail darter is good and suitable habitat for the snail darter which would include within that area of concern successful reproduction?

A. Well, I believe that they are successfully reproducing down there and it is suitable habitat, if that's your question.

Q. And that is primarly and solely based upon seeing several younger darters, snail darters at the [45] area ten miles downstream?

A. Well, that plus the foods there. They are feeding and they appear in good shape, the partially spent female, or what appeared to be a partially spent female.

Q. I believe Mr. Starnes dissected that one that you collected?

A. Right.

Q. Would you agree with his conclusion that that particular specimen found at the location four miles downstream and the other specimen collected at the area approximately fifteen hundred feet below the confluence were in a poor condition nutritionally?

A. Well, no, sir, I don't think they were.

Q. And upon what do you base that conclusion?

A. I base that on my experience of seeing a couple of thousand darters in the Little Tennessee and seeing these fish and they looked in just as good a condition to me as the ones in the Little T.

Q. To what extent did you actually observe those two specimens?

A. Well, to a large extent. We collected them and you could take them out and look at the things.

Q. Did you do that?

A. Yes.

Q. Did you study them in any manner [46] whatsoever other than just a gross visual observation?

A. We did measure them, but we didn't take length and weight and get a condition factor on them, but you can do that on one fish.

Q. Did you in any way determine the age of those two fish that were collected?

A. No.

Q. Can you make that observation of the age of the fish by looking at it, gross visual observation?

A. If you've seen enough of them, I believe you can, up to the age—threes and fours are harder to separate because they do get closer together; ones and twos, and then the three and four group gets——

Q. But you were not able to make a determination of the two specimens you collected as to their age just by gross visual observation?

A. Well, we didn't. I don't think we stated what they were, no.

Q. Do you have an opinion as to what they were, either one of them?

A. Well, I'd say the male we collected at the mouth was probably three years old, just into his third year, and the female was probably about the same.

Q. Do you have an opinion as to whether or not the closure of the Tellico Dam and the creation of the [47] reservoir along the area where the Little Tennessee River now is will destroy the habitat of the snail darter in that area and render it extinct in that area?

A. In the Coytee Spring area?

Q. I'm talking about in the area of the Little Tennessee River where the reservoir will be created.

A. No, I don't think it will be rendered extinct. I think that, like I said earlier, that there's a good chance that they will move on up into the upper reaches of the reservoir and do OK up there.

Q. And what do you think will cause them to move into the upper reaches of the reservoir?

A. Adverse conditions where they presently are.

Q. And what adverse conditions would you say will present themselves?

A. Sixty foot of water.

Q. You consider that an adverse condition?

A. Well, it can be. It would kind of depend on the condition of the reservoir if there will be a high upper landing formed, and so forth, whether there is zero oxygen below such and such a depth. Now, I don't know what the reservoir would do, but this is a possibility, and if it does happen, yes, that would be an adverse condition.

Q. Would it also affect the food source?

[48] A. Yes.

Q. Or sources?

A. Yes.

Q. So, you would agree, would you not, that depth can be a factor in determining whether or not the snail darter, for example, will be able to live, survive, and have a successful habitat in a particular area?

A. Well, I don't know that depth alone could be, but depth in conjunction——

Q. I'm talking about depth as being one factor.

A. Well, I don't think——Depth doesn't make that much difference by itself.

Q. All right, depth in conjunction with what else?

A. With your oxygen supply, your light penetration, and all this sort of things will be—current, all this will be part of it.

Q. In the areas where you observed the snail darter in the Watts Bar, at fifteen hundred feet, and four miles downstream was there any current in those locations?

A. Yes.

Q. To what extent was there current?

A. I'd say—We guessed it at about one to two feet per second with the water off at Fort Loudon.

[49] Q. Is there any reason why the water was cut off at Fort Loudon at those points in time?

A. Yes. So we could get in there and dive because at higher water velocities we won't be able to work.

Q. And what would you estimate the water velocity to be in the Coytee Springs area?

A. Well, it ranges in different areas, depends on where you're taking it, but it would range from one foot per second, or zero flow even, to probably up to five feet per second.

Q. Would you say there's any variation in the temperature, referencing the Coytee Springs area and the two areas in Watts Bar, the fifteen hundred and the four miles downstream locations?

A. I don't think the temperature would vary that much because they're both coming off of impoundment.

Q. Have you actually taken any temperatures and do you have any records which indicate that?

A. We haven't—Well, I'm sure there have been temperatures taken in Watts Bar or Fort Loudon tailwaters, or whatever you want to call them, but I haven't personally looked at them, but we do have temperature of the Little T that I've looked at, but as far as down there, no.

Q. Any documentation or records which you have prepared or in any way been involved with as far as [50] the snail darter program, are they in the file cabinet that Dick Fitz has got in his office?

A. Yes, everything is in that file cabinet.

Q. And there's nothing that you know of in existence out at Norris or anywhere at TVA that relates to the snail darter that's not in that file cabinet?

A. Well, I've got a folder on my desk that has a lot of the current stuff that's going on that I'm adding to all the time.

Q. And what does that relate to? Any of it to the transplant program?

A. The only part that would relate to the transplant program would be relative abundance estimates that we make there. It gets back in the file. It's just out on my desk a lot from time to time.

Q. Would you make that material available to Mr. Wagner or Mr. Pedersen so that I could look at it?

A. Yes. It's in the files really. Yes, it's available.

Q. Mr. Hickman, what evidence, if any, have you or your crew, however you want to term them, found to in any way indicate there has been any successful reproduction activity with regard to the snail darter in the transplant area of the Hiwassee River?

A. Well, we found—well, it started off, [51] they kind of progressed at the same rate reproductively as the fish in the Little T. In other words, the males started flowing about the same time and then the females began to flow at about the same time.

Q. And with the male is that referred to as milting?

A. Yes.

Q. M-I-L-T-I-N-G?

A. Right.

Q. And how would you describe that, if you were describing it to a layman?

A. Well, you just take the fish and you press down his belly and milt flows out. If it doesn't flow out, they're not ready yet. And you do more or less the same thing with the female. The eggs flow out with relatively gentle pressure.

Q. And this, of course, is part of the reproductive cycle inherent to the male and the female?

A. Right. And then after some time we went back again and then we started picking up females that were spent and partially spent and a few that weren't spent yet. They apparently were in the process of spawning then. And then we have picked up some eggs, so far is as much as we've got, and can identify them down to Percid eggs, which that is all that could be spawning in there in the Percid family.

[1] In the United States District Court for the Eastern District of Tennessee, Northern Division

No. 3-76-88

HIRAM G. HILL, Jr., ZYGMUNT J. B. PLATER AND DONALD S. COHEN, PLAINTIFFS

vs.

TENNESSEE VALLEY AUTHORITY, DEFENDANT

APPEARANCES

Representing the Plaintiffs:
Mr. W. P. Boone Dougherty
Mr. William W. Garner

Representing the Defendant:
Mr. Thomas A. Pedersen
Mr. Nicholas DellaVolpe

Deposition

The deposition of *JAMES DAVID WILLIAMS, SR.*, taken by agreement, on the 5th day of April, 1976, pursuant to Rule No. 26 of the Civil Rules of Federal Procedure, for the purpose of discovery, in the office of the witness, 1216 K Avenue, Washington, D.C.; said deposition being taken before James J. O'Brien, a Notary Public in and for Knox County and the State of Tennessee.

[2] All formalities as to caption, certificate, transmission, and so forth, are waived; and it is agreed that James J. O'Brien, the reporter, may sign the name of the witness to the deposition after transcription; said deposition being taken subject to exceptions only for incompetency, irrelevancy, and immateriality of the testimony.

The Witness, *JAMES DAVID WILLIAMS, SR.*, being of lawful age, and after having first been duly sworn, deposed as follows:

EXAMINATION

By Mr. PEDERSEN:

Q. State your full name and address for the record, please.

A. James David Williams, Sr., 2318 Hilda Rose Drive, Silver Springs, Maryland, 20902.

Q. How old are you, sir?

A. Thirty-five.

Q. And by whom are you employed?

A. By the Fish and Wildlife Service.

Q. How long have you been employed by Fish and Wildlife Service?

A. Approximately a year and a half.

[3] Q. In what capacity?

A. As a staff specialist in the endangered species program.

Q. What aspect of the endangered species do you specialize in?

A. Primarily fish.

Q. What are your duties in connection with that?

A. The duties cover a range of things. Primarily, it is the responsibility for preparing status reports and other related documents in preparation of listing and determinations of critical habitat.

Q. You say you are an ichthyologist?

A. That is correct.

Q. What phase of ichthyology, taxonomy, biology or what?

A. It has been more systematics, taxonomy and ecology than anything else.

Q. Not biology primarily, in other words?

A. Not fisheries biology, no.

Q. And by taxonomy you mean classifying various species?

A. Yes. Systematics and relationships.

Q. And how does that fit in with the habitat work? What is your involvement in the habitat part of it?

[4] A. Well, in dealing with systematics you deal in relationships and a lot of this gets into the life history and habits of the particular species, where they live, and from there it automatically gets you into habitat.

Q. Tell us something about your formal education, where you went to school, what you studied, and that sort of thing.

A. I started out my college career at Middle Georgia College in Cochran, Georgia. That was in 1959 and 1960.

Q. What college was that?

A. Middle Georgia College, Junior College, in Cochran, Georgia. From there, I went to the University of Alabama where I received my B.S. in 1962, my M.A. in 1963, and M.S. in 1965, and Ph. D. in 1969.

Mr. DOUGHERTY. Tom, for the record, he has a vita if you would like to examine it, and maybe file it as part of the record.

Mr. PEDERSON. Yes.

A. The only thing that has changed on that has been the home address. I have just recently moved, and also the phone number, but otherwise it is pretty much up-to-date for the past year.

Mr. PEDERSEN. Let's file this vita, then, [5] describing your background activities as Exhibit No. 1.

Mr. DOUGHERTY. Consisting of three pages, Collective 1.

[Thereupon, the vita was so marked and filed as Collective Exhibit No. 1.]

Q. When were you first contacted about being a witness in this controversy involving the snail darter?

A. That was about, oh, a couple of weeks before the trial which took place.

Q. Before the first hearing in Knoxville?

A. Before the first hearing in Knoxville.

Q. Before Judge Taylor?

A. That is correct.

Q. About two weeks before that?

A. Right.

Q. And did you appear at the hearing?

A. I appeared at the hearing, yes.

Q. Voluntarily or by subpoena?

A. It was by subpoena.

Q. Now, you were in Washington at the time?

A. That's correct.

Q. Now, when you appeared, who paid for your appearance and the expenses with respect to that?

A. The travel expenses and so forth?

[6] Q. Yes. Whatever expenses there were.

A. The Fish and Wildlife Service; just a regular travel authorization form submitted.

Q. In appearing as a witness in this case are you acting and speaking on behalf of the U.S. Department of Interior or merely in a personal, individual capacity?

A. Well, I am employed by the Fish and Wildlife Service and I can speak as a biologist for the Fish and Wildlife Service, but not as to policy-type matters.

Q. Is that the capacity in which you are appearing? Do you speak for the Department of Interior as a biologist or are you expressing your own individual views?

A. I am appearing as a biologist.

Q. Now, who authorized you to make such an appearance?

A. That was through my immediate superior here, the Chief of the office, and from there the Associate Director.

Q. What are the names? Who is your immediate superior?

A. Actually, the immediate superior here is John Paradiso, who is the Branch Chief of Biological Support. Then from there it goes to the Chief of the office.

Q. Who is that?

A. Ron Skoog.

[7] Mr. DOUGHERTY. Could you spell that for the record?

A. Yes. S-K-O-O-G. And from there, the Associate Director, Mr. Keith Shriner.

Q. And then what is above Keith Shriner?

A. That would be the Director of Fish and Wildlife Service, Mr. Greenwalt.

Q. And which one of them was it that authorized you to appear as a witness?

A. It went as far as Keith, and I can't say beyond that, you know, how the chain goes up beyond there. That was where my contact was by way of a memo informing them and all that I would appear.

Q. In other words, you are instructed and restricted to biological testimony; is that correct?

A. That is correct.

Q. And not any public policy or legal matters?

A. That is correct.

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Q. Do you have a written authorization? Did I understand you to say you had a written authorization to do that, or what?

A. No, I sent up a memo informing Keith, and again this went through the office, and this was last week, and from there it was by word of mouth by the Chief that I [8] was given permission.

Q. I see. There is no written authority then?

A. No.

Q. Do you consider yourself to be an expert on the snail darter or its habitat?

A. On the particular fish itself, that particular species?

Q. Yes, the snail darter.

A. No.

Q. On no part of it, either its habitat or nothing else with respect to the snail darter itself?

A. That particular species, I have had very limited—well, limited experience with.

Q. You have done no independent research on the snail darter, I take it then?

A. That is correct.

Q. Now has the Department of Interior or the Fish and Wildlife done any independent research on the snail darter?

A. That is correct.

Q. That is they have not?

A. They have not.

Q. Is it fair to say then that whatever you know about the snail darter is what you have gained from TVA or others who have been studying it in connection with this [9] controversy?

A. That is correct.

Q. Are you an expert on any of the darters?

A. Yes, I have studied both—well, all three genera in the family, sub-family. In this particular group, I have studied and am in the process of describing a new species that is closely related to the snail darter, that occurs in the upper part of the Coosa River System.

Q. What is the name of that darter?

A. It hasn't been described yet. We haven't given it an official name. In other words, it hasn't been published yet. But it occurs in the upper part of the Conasauga River.

Q. Describe briefly the process for classifying a new species.

Mr. DOUGHERTY. Are you talking about by the Office of Endangered Species?

Mr. PEDERSEN. Well, by anybody who would do it.

A. Well, generally the discovery of a new species takes quite a bit of background information. In other words, you have to be familiar with everything that occurs in a particular area in the way of, well, in this case darters. Then you turn up something that doesn't look like anything else that you are familiar with and from there, [10] then, you can proceed to go into more detailed investigations, such as morphological studies, behaviorial studies, life history, habitat requirements. It is more or less a matter of being able to recognize, first of all, that it is not something that is already named.

Q. Well, then, is there some recognized procedure of getting the views of the scientific community as to whether it is a——

A. Yeah, different people do this different ways. One way is to circulate it informally among colleagues, get their comments on it, and then from there it is published in generally a referred journal. Some people just send it directly to the refereed journal, to start with, without getting comments of their co-workers first. Both are accepted practices, and it just kind of depends on the individual. But the refereed journal, then, generally sends it out to three or four reviewers and it undergoes a period of review and then from there, if it is accepted for publication, this is generally the stamp of approval that says the conclusions that are drawn in the manuscript of the publication are correct. At least based on the information that is contained in them.

Q. Well, do I understand apart from classifying one under the Endangered Species Act, that you normally have to have the description, and so forth, published in a [11] recognized scientific journal before it is recognized as a separate species?

A. No. We have had, in addition to the snail darter, which we listed as Percina (Imostoma) species, we also listed a trout from Arizona which was described later, but when it went onto the list, it was without a scientific name.

Q. Yes. In other words, that's what happened with the snail darter. It went on the list before the scientific description, is that right?

A. That is correct.

Q. And then the description came how much later, would you say?

A. About two months later.

Q. But where you don't go through the U.S. Game & Fish for purposes of listing it on the Endangered Species Act, but speaking of just the scientific community, generally when they are discovered, and in classifying a new species, the general accepted practice is it has got to be described first and published in scientific literature before it can be recognized as a species, is that correct?

A. Well, before it is given a name, of course. But then you can still refer to it in scientific publications, and so forth, just as S.P., the species, but without a name.

[12] Q. But it first has to be put up publicly for the scientific community to give its input with respect to whether it is, in fact, a separate species; is that right?

Mr. DOUGHERTY. I object to the question on the ground that it is confusing and does not delineate the manner in which he is talking about, communicated to the scientific community. I think the question should be clarified before the witness answers.

Q. Do, you understand what I am saying, or what is missing?

A. No, I don't quite understand the way we are going at it.

Q. Well, before you can say that you have a new species, as you call it, listing, but before that don't you have to have a description of the animal published in recognized scientific journals community has something to criticize or agree with?

Mr. GARNER. I would have to object, to the extent that the question is intended to ask him whether as a legal matter the listing of the species by the Department of the Interior must be preceded by the full panoply of scientific recognition.

[13] Mr. PEDERSEN. No, I was asking independent of the Department of Interior, and in a species that is not going to be listed at all.

Q. Do you know what I'm talking about? That is what I am talking about, as to whether you say, "I have found a new species."

Mr. DOUGHERTY. Well, now, I object to the question because that is not the question you were previously asking him.

Mr. PEDERSEN. That's what I was trying to ask him.

Mr. DOUGHERTY. No, your previous question was prefaced with the concept or listing, and I think you need to clarify

it in terms of what you mean before this witness can properly be asked to answer the question.

[Thereupon, a short conversation was held off the record.]

Q. To your knowledge are there any experts on the snail darter in your office?

A. No.

Q. Nowhere in the Interior?

A. No.

[14] Q. Nor any experts about the snail darter's habitat?

A. No.

Mr. DOUGHERTY. Now, you are talking about in the Interior?

Mr. PEDERSEN. In the Interior, yes.

Q. By Interior, I mean all of the regional offices as well.

A. That is correct.

Q. Now, you do have your main headquarters here in Washington; right?

A. That's correct.

Q. And how many ichthyologists are there here in the Washington office?

A. In the Washington office I am the only ichthyologist here.

Q. You are the only ichthyologist?

A. That is correct.

Q. And there are no experts on the snail darter in the Washington office?

A. That is correct.

Mr. GARNER. For point of clarification, do you mean within the Endangered Species Office or within the Fish and Wildlife Service?

[15] Mr. PEDERSEN. I mean within the Fish and Wildlife Service.

A. Within the office, of course, there is only myself as an ichthyologist. But within the Fish and Wildlife Service in Washington, there are a number of ichthyologists.

Q. A number of ichthyologists?

A. Yes.

Q. But none of them are an expert on the snail darter?

A. That is correct.

Q. And, of course, you have scientists in many other fields than ichthyology, I take it?

A. That is correct.

Q. Are there any experts on darters in the Fish and Wildlife Service here in Washington?

Mr. DOUGHERTY. Are you talking about including Mr. Williams?

Q. Yes, include yourself.

A. Yes.

Q. How many experts are there on the darters generally?

A. In the Fish and Wildlife Service in Washington, I'd say I am probably the only one.

Q. You are the only one?

[16] A. Yes.

Q. Now, you mentioned your immediate superior. Who did you say he was?

A. Dr. John Paradiso.

Q. What is his specialty?

A. He is a mammalogist.

Q. That has nothing to do with ichthyology, is that correct?

A. No. That is correct.

Q. And then above him was Dr.——

A. Ron Skoog.

Q. Skoog?

A That is correct.

Q. What is his specialty?

A. He is also a mammalogist.

Q. And then those above him are all—what are they? Just go right on up the line.

A. Wildlife biologists, in general.

Q. Either that or administrative people, is that correct?

A. That's correct.

Q. That includes Shriner and Greenwalt?

A. Yes.

Q. They are just——

A. Wildlife biologists.

[17] Q. Wildlife biologists and not ichthyologists, either one of them?

A. That is correct.

Q. Now, how many people are under your supervision?

A. None.

Q. None?

A. Other than secretarial staff.

Q. That's what I mean, yes. No scientists?

A. No.

Q. Now, what about the Atlanta office, who is the head of that?

A. That is Mr. Ken Black.

Q. What is his specialty?

A. He is a wildlife biologist.

Q. But not an ichthyologist?

A. Not an ichthyologist.

Q. And beneath him is whom?

A. I am not sure of the hierarchy in the regional office.

Q. They won't get mad at you if you make a mistake.

A. Ray Vaughn is the—we are right now in reorganization. I am not sure, really, what the hierarchy is.

Q. Was it Ray Vaugh, did you say?

[18] A. That is correct.

Q. Okay, what is he?

A. He is the Assistant Regional Director.

Q. And what is his specialty?

A. He is a wildlife biologist.

Q. When you say this, I know you mean he is not an ichthyologist.

A. That is correct.

Q. And then next in line below him?

A. Beyond that I am not sure what the hierarchy is. One of the divisions in the regional office deals with Federal Aid and under that program comes endangered species. In fact, right now one of those positions is vacant. The individual who is in the regional office who handles endangered species problems is Mr. Gary Henry, who is a wildlife biologist.

Q. Gary Henry?

A. That is correct.

Q. And he is not an ichthyologist?

A. That is correct.

Q. And then under his supervision?

A. No professional staff.

Q. No professional staff?

A. That I am aware of.

Q. So then, in the Atlanta office there are [19] no ichthyologists at all?

A. Not in the Endangered Species Program. They may have them in other areas, like fish hatcheries or something like that,

but not directly associated with the Endangered Species Program.

Q. Are their names known to you, who these other ichthyologists are?

A. No, they are not known to me.

Q. Incidentally, do you have any organizational charts showing the whole structure of the Interior, and in the Fish & Wildlife?

A. Yes.

Q. Do you have that available so that we might file it?

A. I can get it for you.

Q. All right, would you, and would you file the one on the Interior as Exhibit No. 2?

A. All right.

[Thereupon, the organizational chart on the Interior was to be marked and filed as Exhibit No. 2.]

Q. And then on the Fish and Wildlife as Exhibit No. 3?

A. All right.

[Thereupon, the organizational chart on the [20] Fish and Wildlife Service was to be marked and filed as Exhibit No. 3.]

Q. And if it is not on that chart you would have the Endangered Species office, is that right?

A. Yes.

Q. Is that in both places or just in Atlanta?

A. No, it would be broken down to the regional office there and under the Washington office here.

Q. That will all show on these organizational charts?

A. Yes. Well, the actual organizational chart in Washington on the Fish and Wildlife Service just shows it as Office of Endangered Species. If you want it within the office, I would have to supply that for you.

Q. Yes, would you, and make a separate sketch or whatever it is.

A. All right.

Mr. DOUGHERTY. Is this just for the Washington Office?

Mr. PEDERSEN. Well, I would like it on both of them because I am not familiar with the breakdown. We would like to see who it is we are talking about.

[Thereupon, the organizational charts in the endangered species offices of both [21] Washington and Atlanta were to be marked and filed as collective Exhibit No. 4.]

Q. Could you show on that chart the names of the people that are filling these various positions? Would that be too big a chore?

A. In the region—yeah, I could get it in the region for you.

Q. Now, do you also have an office in Nashville?

A. No.

Q. No?

A. We may have law enforcement people there, but not a Fish and Wildlife Service office.

Q. Only law enforcement?

A. We may not even have that. But if there is anybody there, it would probably be law enforcement.

Q. You don't know their names?

A. No.

Q. Do you have an office at Norris, Tennessee?

A. Yes, we do.

Q. Who is in that office?

A. That is Mr. Boles.

Q. Only Mr. Boles?

A. No, there is another individual there, but [22] I don't recall his name right off.

Q. What is Mr. Boles' specialty?

A. Fisheries, I believe.

Q. Fisheries?

A. I believe. I am not sure of that.

Mr. DOUGHERTY. Could we have his first name?

A. Hal.

Mr. DOUGHERTY. B-O-L-E-S?

A. That is correct.

Q. Would he be classified as an ichthyologist or not?

A. No.

Q. He is a technician?

A. Well, he is probably more towards fisheries management, but not an ichthyologist.

Q. Mr. Boles at Norris, is he a part of the regional office out of Atlanta?

A. That is correct, the regional office.

Q. He responds to them?

A. That's correct.

Q. Now, I take it that you have communicated many times with various people in TVA about the snail darter over the recent months, have you not?

A. That's correct.

[23] Mr. GARNER. Do you mean in his personal capacity or as this office?

A. As the office.

Q. Who are the people that you have talked to, if you can remember their names?

A. Tom Ripley, I have talked with on occasion, and Dick Fitz, and possibly Jack Chance, although I am not sure about that. Those would be the only individuals.

Q. You know all three of these men, do you?

A. That is correct.

Q. And you have also exchanged correspondence with them?

A. The office has, yes.

Q. Well, some of it in your name, right?

A. I think there may have been one or two things in my name. Most of them probably have been signed by the chief of the office.

Q. I see. Now, when it comes to others in the office, if it is sent to them, does that come to you also?

A. Yes. It filters down through the system.

Q. So if anything comes to Mr. Shriner you will see it?

A. Eventually, yes.

Q. Or anybody else up the line?

A. Greenwalt, yes.

[24] Q. And that includes Dr. Skoog, and so forth?

A. Yes.

Q. And you have had phone calls with these various people in TVA as well as personal conferences?

A. That is correct.

Q. Now, I believe you also have visited the TVA office and laboratories in Norris, have you not?

A. That's correct.

Q. And I believe they have conducted you on tours of the project area?

A. On one trip, on one occasion.

Q. One occasion only?

A. That's correct.

Q. Have they always cooperated fully with you and given you any information you have requested?

A. Yes, they have.

Q. Do I understand correctly that you are really the one that is primarily responsible for the listing of the darter itself?

A. That is correct. Or at least for the determination of status and reviewing reports.

Q. And would the same be true about describing its habitat?

A. Description of habitat?

Q. Yes. The range habitat and the [25] description of it.

A. No, we have relied on documents from TVA and from the biologists at the University of Tennessee.

Q. You have made no independent study of that whatever?

A. No.

Q. Just reviewing this material that you have received?

A. That is correct.

Q. Now, the issuing of the permits, does that fall within your responsibility also?

A. No, that's in the divisional law enforcement.

Q. Law enforcement?

A. That's correct.

Q. Did you have any input into that at all?

A. Yes. We review permit requests in this office, and I have at least had some input into it. That's correct.

Q. Could you state what the extent of your input has been?

A. Yes. The permits when they come into law enforcement they are processed down there for the publicational of the Federal Register. They then send them upstairs and ask if there is enough information contained in the permit [26] request so that anybody that reads this in the Federal Register will have a clear understanding of what the request is about and for. From there, if we have any recommendations as to alterations or amendments to the permit, then we make these recommendations.

Q. That would be you primarily?

A. For fish. That is correct.

Q. So, any restrictions or limitations in it would be what you have recommended?

A. Basically, yes.

Q. Has your office made any type of environmental assessment or report on the effect of the listing of the darter?

A. Yes, we have.
Q. What is the date of that report?
A. I would have to check. It would be sometime prior to the listing. I am not sure, but it would be what was put together and drafted prior to the listing.
Q. Do you have a copy of that available here in your office that we could look at?
A. Yes, it's in the vault.
Q. Could you send somebody to get it that we might look at it, or, would you file it as an exhibit to your testimony?
A. Yes. I could file it as an exhibit. I [27] can get it. It would take me to find it.
Q. All right, you file that as Exhibit No. 5.
[Thereupon, the environmental assessment report on the effect of the listing of the darter was to be marked and filed as Exhibit No. 5.]
Q. Did you author this document?
A. Parts of it, yes.
Q. Who was the main author, would you say?
A. I guess I would be the primary author.
Q. You were the primary author?
A. Yes.
Q. How large a document is that?
A. I don't recall specifically how many pages it is.
Q. For what purpose was it prepared?
A. For the listing.
Q. For the listing?
A. Yes.
Q. Is that required by regulations and statutes?
A. As I understand, it is, yes.
Q. Who assisted you in this preparation?
A. Jan Hill. She is one of the biologists here in the office also.
[28] Q. She is not an ichthyologist?
A. A fisheries person, but not an ichthyologist, no.
[Thereupon, a short conversation was held off the record.]
Q. When did you first become aware of the snail darter and how?
A. It was in September of 1974, I believe. Let me backcount here.

Mr. DOUGHERTY. Discovered August 12, 1973.
A. Yes. It would be, I'd say, early 1974.
Q. Early 1974?
A. Right.
Q. What were the circumstances?
A. Well, first of all, it was prior to my coming to Washington or joining the Fish and Wildlife Service. It was in professional contacts with Dr. Etnier.
Q. Who were you working for at that time?
A. I was teaching at Tuskegee Institute.
Q. Tuskegee Institute. You were teaching there?
A. That's right. In the Biology Department.
Q. And then Dr. Etnier came to see you there?
A. I guess, really, it was probably at [29] meetings when I first saw it, you know, late that year.
Q. You have known him for a number of years; is that so?
A. Yes, since about 1966 or 1967, somewhere along there.
Q. Did you go to school together or anything? How did you happen to know him?
A. I got to know him professionally through the—well, the American Society of Ichthyologists, and herpetologist meetings and Association of Southeastern Biologist meetings, and field trips.
Q. And he came to see you at Tuskegee, is that it?
A. He didn't actually come to see me at Tuskegee, but the fish, I first saw at meetings, which would be early 1974, or around there, at professional meetings.
Q. And then you came with the Fish and Wildlife when?
A. In September of 1974.
Mr. DOUGHERTY. Could I ask for the record, just to clarify, what is the precise name of the Southern group that you referred to? You referred to the American Society of Ichs and Herps, and what was the other?
[30] A. The Association of Southeastern Biologists.
Q. And since that time in early 1974, have you corresponded frequently with Dr. Etnier?
A. Yes. It's been more on the telephone, I guess, than correspondence, but we are in touch fairly regularly, because we are co-authoring several papers together.
Q. Do you have in your files copies of the correspondence that has been exchanged between you and Dr. Etnier with respect to the snail darter?

A. With respect to the snail darter, I am not sure we have even corresponded on that, except by telephone. If we have, whatever we have received is in the files, if we have received anything, and I can't recall any specific piece of correspondence right off.

Q. Well, if there is such correspondence, would you attach that collectively as an exhibit to your deposition?

A. Sure.

[Thereupon, the correspondence was to be late filed as Collective Exhibit No. 6.]

A. When you are short of secretarial staff, it is much easier to call someone than write them.

[Thereupon, a short conversation was held off the record.]

[31] Q. And in your telephone conversations, would you have made any notes with respect to the substance of those?

A. No.

Q. But if there are any, you would hook that on with the correspondence?

A. Sure.

Q. I want it clear as to what we are talking about. This correspondence you have had with Dr. Etnier is both before coming and while you are here in this Fish and Wildlife office. You understood that, did you not?

A. Yes.

Q. I thought so. I just wanted to make sure. Now, have you also corresponded with the plaintiffs in this lawsuit?

A. No, I have not.

Q. None at all?

A. None at all.

Q. You have not sent or received any correspondence or letters from Prater or Cohen or Hill?

A. Not personally. Everything I have received has been addressed to either the Director or Associate Director and has filtered down to me from them.

Q. Well, regardless of to whom it was directed, would you attach copies of that correspondence from the [32] plaintiffs to your deposition?

A. All right.

Mr. DOUGHERTY. Correspondence from?

Mr. PEDERSEN. And to ,yes. From and to. Put it all together.

[Thereupon, any correspondence from and to the plaintiffs was to be marked as late filed Exhibit No. 7.]

Q. Have you met personally with any of these three plaintiffs at any time?

A. Yes, I have.

Q. On what occasion?

A. This was the trip to Knoxville when I looked over the snail darter habitat originally, when I went to visit with TVA. In the evening following the field trip we took that day, we met.

Q. Where did you meet?

A. In a lounge somewhere in Knoxville.

Q. Well, I'm not interested in that, of course, unless you were discussing the snail darter. Did you discuss any aspect of the snail darter?

A. I am sure it was discussed, yeah. It was.

Q. Would there be any way of your stating the substance of what the discussions were?

A. At that point it was primarily with [33] respect to the effects of the cutting on the snail darter. At this time TVA had let some timber contracts. This is basically what I had been reviewing in the helicopter flyover that day.

Q. I see. This same problem?

A. That's right.

Q. Do you remember when that was then?

A. I don't recall right off. I believe it was the Spring of last year, though.

Q. Did you prepare any file memoranda with respect to the trip to the Tellico Project, TVA's office, and so forth?

A. There may be a trip report. We are generally expected to file some kind of a trip report following something like that. I am not absolutely sure there is one on that one, but I can check and see.

Q. If there is one, would you attach that as an exhibit to your testimony?

A. Sure.

[Thereupon, the trip report was to be marked and filed as late Exhibit No. 8.]

Mr. DOUGHERTY. I think we can have the understanding, can't we, that some of these documents will require searching and preparation, and Mr. Williams can give [34] them to Mr.

Garner and he can forward them to us for giving them to the court reporter?

Mr. PEDERSEN. Yes. I would like to make the request that you do this with all dispatch, because, as you know, the eve of the trial is on us, and I hope you will sympathize with us on that. It has been an expedited hearing, as you know, and we would ask you to cooperate as fully as you can on that, and I am sure you will.

Q. Did you indicate the nature of the article that you were co-authoring with Dr. Etnier?

A. I don't believe I did. There are actually two of them. One of them is the description of the new species of darters, Genus Percina, from the upper Coosa River System in Georgia and Tennessee, and the other one is a description of a new species of darters of the Genus Etheostoma from the Duck River System or the lower Tennessee River System in Tennessee.

Q. How many species of darters are there?

A. If you include all of them, more than a hundred.

Q. More than a hundred?

[35] A. Yes.

Q. And how many new species have been discovered, say, in the last ten years?

A. Somewhere in the neighborhood of ten or twelve.

Q. Ten or twelve for the whole ten years?

A. For the ten years.

Q. You were referring to the timber clearing. I believe that you became concerned with that back in December of 1974, did you not, Dr. Willams?

A. Yes.

Q. And you requested Mr. Porter of TVA to supply you with some information regarding that?

A. That is correct.

Q. Would you look at that letter and see if that is a copy of the response you got from Mr. Porter?

A. Mr. Taylor, you mean?

Mr. DOUGHERTY. Porter Taylor.

Q. Porter Taylor, I mean, yes.

A. Yes.

Q. What is the date of that?

A. 26 December of 1974.

Q. Will you file that as Exhibit No. 9?

[Thereupon, the letter of December 26, 1974, was so marked and filed as Exhibit No. 9.]

[36] Q. Now, that letter was dated nearly a month before the plaintiffs filed their petition for a listing of the darter; is that not so?

A. That is correct.

Q. How would that come to your attention that far in advance of the request for the listing?

A. That would be through Dr. David Etnier.

Q. He asked you to get this material, is that it?

A. He didn't ask me to get it. He expressed concern to me about that timber clearing operation and from there I requested the information.

Q. And then it was on January 20, 1975, that the petition for the listing was submitted; is that correct?

A. That's correct. Thereabouts.

Q. And among other things, that had a decription of the darter, and the darter's habitat?

A. That is correct.

Q. And why the habitat was vital?

A. Yes.

Q. And referred to the TVA timber operation, is that right?

A. That's correct.

Q. Do you recall that in that petition the habitat was stated as being between River Mile 5 and 17?

[37] Mr. DOUGHERTY. You mean Point 5?

Mr. PEDERSEN. No, five. River Mile 5.

A. I think that was the figure that they had in the original document.

Q. And then later in March do you recall writing to Governor Blanton on March 7, 1975, requesting that there be an emergency listing of the darter?

A. That's correct.

Q. And the document you have, is that a copy of the letter that went out to Governor Blanton?

A. Yes. I might clarify this. This was signed by the secretary. It wasn't from me individually.

Q. You helped prepare that, I assume?

A. Yes.

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Q. Did you author it completely or just the main part of it?
A. Most of it.
Q. Most of it?
A. Yes.
Q. I would like to file that as Exhibit No. 10 to your testimony.
[Thereupon, the letter of March 7, 1975, was so marked and filed as Exhibit No. 10.]
Q. Now, the basis for that emergency listing was that you felt there was a hazard from the TVA timber [38] operation, is that right?
A. That's correct.
Q. Now, that refers also to the habitat as being between Miles 5 and 17, does it not, the first sentence of the second paragraph?
A. Yes.
Q. Now, you have since learned that that is in error, have you not?
A. Yes, it is.
Q. Now, have you come out with a new description and range of the habitat?
A. Well, the habitat, as we proposed it in the Federal Register in December, was from 0.5 River Mile to 17.
Q. Now, 0.5, that is the location of the Tellico Dam, is that right?
A. That is correct.
Q. Had you been advised at that time that TVA has found the darters below 0.5?
A. It was about that time when I drafted the 16 December document, which was like two to three weeks prior to that, that, to the best of our knowledge, was the range. It takes a period of a week or so for things to go through the mail system and filter down.
Q. You have since been informed, have you [39] not, that darters have been found in the Watts Bar Reservoir down below the Tellico Dam, is that correct?
A. Below the mouth of ——
Q. Yes.
A. That's right.
Q. How far down the river? How far into the Watts Bar Reservoir have they been found, to your knowledge?

A. According to the documents that we received from the Tennessee Valley Authority, it was down, I believe, to River Mile—I believe the last document said River Mile 10.
Q. Ten?
A. I believe so. I am sure of four, and I think ten.
Q. Yes, four and ten, that is correct. Will that affect your description of the habitat, showing the range of the darter, that new information?
A. Well, what we have proposed as the critical habitat, of course, is the 0.5 to River Mile 17, and we commented in there that any additional areas would be considered, and at this point, we have not evaluated the area even below the dam or downstream four to ten miles below, or the transplant sites.
Q. After you have evaluated that, what will be done with it? Will you publish something new in the [40] Register to show that it has been found elsewhere and where it has been found?
A. It depend on the results. Of course, if it is reviewed, looked at, and we determine that this is in all likelihood critical habitat, then it would be published in the Federal Register as a proposal and then open for comment and then for final write-up.
Q. Well, you certainly consider it important that they have been found down there, do you not?
A. Yes, that is important.
Q. Does that come as a surprise to you that they were found down there?
A. In the mouth of the Little T, four miles down and ten miles, not a real surprise, no.
Q. Not a real surprise?
A. No. At least in the numbers that they have been found in the reports that were submitted by the TVA.
Q. Well, suppose they were found twenty miles or fifty miles down, would that be very significant?
A. Yes.
Q. Of if they were found above Fort Loudon Dam, would that be significant?
Mr. DOUGHERTY. I object to the question on the grounds there is no factual evidence to support that hypothesis at this time.
[41] Q. I am just asking a hypothetical question.
A. Hypothetical, if it is found above——

Q. Fort Loudon.
A. Fort Loudon?
Q. Yes.
A. Yes, that would be significant.
Q. More significant than if it is found below Fort Loudon or of the same significance?
A. Probably more.
Q. Probably more. Explain why that is.
A. Well, the downstream areas below the mouth could expect to get some drift out of the mouth of the river system, like the Little T downstream. If it is found above the next dam—Fort Loudon?
Q. Fort Loudon, yes.
A. That would indicate movement in the other direction.
Q. A very significant thing, you think?
A. Well, it would be more significant than the downstream localities, yes.
Q. Now, in your letter to Governor Blanton you say that the food of the snail darters is almost exclusively snails; is that correct?
A. That was based on the information that we had available at that time, yes.
[42] Q. You would have to revise that substantially now, would you not, in view of what you know?
A. Based on the reports that we have got, there is an indication that they do feed on things other than snails.
Q. Would you say that perhaps less than sixty percent of their diet is snails?
A. I am not sure of the percentages.
Q. There is a large percent of it that represents larvae of various flies; is that right?
A. I believe that was in one of the reports, yes.
Q. In fact, isn't it also true that in some seasons of the year it is actually consuming a larger percent of larvae of flies than it is snails?
A. I understand that is the case, yes.
Q. How did Governor Blanton respond to your suggestion that the listing be done on an emergency basis? Did he agree with you?
A. No, he did not.

Q. Now, you were asking that he consent to a period of one week or less; is that not so?
A. I believe that was the wording in it, yes, sir.
Q. That is an extraordinarily abbreviated [43] period, is it not, to make any intelligent, meaningful comment?
A. For the emergency listing, which is effective only for a hundred and twenty days, it is not that extreme, I don't think.
Q. Following that letter of March 7, 1975, to Governor Blanton, in which you were concerned about the timber cutting, did you have occasion to go out to Norris at TVA's invitation to look over the site?
A. Yes, I did.
Q. And was that on March 24, 1975?
A. That sounds about right. It was Spring.
Q. In the spring?
A. Yes.
Q. You went out to the Norris office, is that correct?
A. That is correct.
Q. And who did you meet with there?
A. I met with Dr. Ripley, Dick Spitz, Jack Chance, I believe was there, and a couple of other individuals, I don't recall. I'm not sure right off.
Q. Did you prepare a file memorandum reporting on that trip?
A. I believe that is the one that we were referring to earlier.
Mr. DELLA VOLPE. Exhibit 8, the trip [44] report, is that it?
A. Yes. I'll have to check. I'm not sure.
Q. They took you on a helicopter tour, did they not?
A. That is correct.
Q. Now, you went up to River Mile 6. Was that the first stop you made there?
A. I am not sure it is six. Davis Ferry.
Q. Davis Ferry Road, yes; near Davis Ferry Road.
A. That's correct.
Q. And what was the situation that you observed with respect to the turbidity of the water and of TVA's operation?
Mr. DOUGHERTY. May I correct something for the record?
Mr. PEDERSEN. Surely.
Mr. DOUGHERTY. Am I not correct that Davis Ferry is River Mile 17 or thereabouts, or is that Davis Island?
A. Davis Island.

Mr. PEDERSEN. That is Davis Island.

Mr. DOUGHERTY. Is that different from Davis Ferry?

A. Yes.

[45] Mr. DOUGHERTY. OK.

A. The river was extremely turbid and, of course, it was very difficult to judge the effect of the timber cutting in terms of siltation and turbidity since they had had real heavy rains the night before and that morning, in fact, we were delayed a little bit taking off because of rains.

Q. Well now, am I correct in understanding that you went up one of these creeks at that area to see where the turbidity was originating?

A. We went up one of them to see where they had cleared and cut timber, that is correct.

Q. And then you went up beyond where they were clearing the timber and found the stream equally turbid up there, did you not?

A. Yeah, everything was turbid.

Q. And then you stopped at River Mile 7, Coytee Springs, and looked at that?

A. That is correct.

Q. The same situation existed there?

A. Yes.

Q. And then you went up to Nine Mile Creek and the Tellico River where they enter the Little Tennessee, didn't you?

A. That is correct.

[46] Q. Would it not be fair to state, Dr. Williams, that that is where most of the silt was coming from, from the Tellico and Nine Mile Creek?

A. The Tellico was muddier than the main channel of the Little T at this point, yes.

Q. And that was not due to TVA's timber cutting in any way?

A. I was not aware of any clearing on the upper part of the Tellico, no.

Q. Didn't you actually go up the Tellico River then to see where all of the silt and turbidity was?

A. Yeah. Actually we came down, because we went on up the Little T to Chilhowee and then cut across the ridge there to the upper part of Tellico and down the Tellico then to the Little T. But again, on that particular occasion the conditions

were such that everything was muddy. It was really difficult to make any evaluation of impact at all because of that.

Q. Yes, except when you got above Tellico and Nine Mile and got closer to Chilhowee Dam, the river was clear up there; right?

A. Yes. It was very clear right there below Chilhowee Dam, and it got progressively muddier downstream.

Q. Yes, as the streams came in below Chilhowee, the turbidity got worse?

[47] That's correct.

Q. What did you observe when you went up to Tellico Plains, up the head of the river there, I mean, at Tellico Plains?

A. Saw quite a bit of agricultural area, a lot of cleared land.

Q. Did you also state that based on that tour and on the discussions you had, you could see no real impact from the logging operations so far as the snail darter was concerned?

A. From the logging operations that we observed at that point, it was not, or at least I didn't feel it was significant to warrant the emergency listing.

Q. Did you see a letter dated August 20, 1975, from Dr. Ripley of TVA to Dr. Skoog with respect to the TVA's program to conserve the snail darter?

A. Yes.

Q. And that is the letter you have in your hand?

A. That is correct.

Q. Would you file that as Exhibit No. 11?

[Thereupon, the letter of August 20, 1975, was so marked and filed as Exhibit No. 11.]

Q. Now, in that document it is stated, "We believe this is a sound program and one that offers high [48] potential for the successful introduction of this darter into other large river habitats where it apparently does not now occur." Do you agree that it is a sound program?

A. Would you restate the question, please?

Q. Yes. I was asking you if you agreed with TVA's statement that, "We believe this is a sound program and one that offers high potential for the successful introduction of this darter into other large river habitats where it apparently does not now occur."

A. I would say it's a fair program for the introduction, yes.

Q. Now, in that letter they said, "We would appreciate having your detailed recommended comments on this work and will be glad to discuss the program with you at your convenience." Did you ever comment on the program?

A. Yes. We were also supplied with a copy of the conservation program with the materials that TVA submitted in their comments to the proposal to list.

Q. To the listing of it?

A. Right. And this was the same program that came in attached to this letter, and we responded to all of that, made all of our comments in the Federal Register publication for the final rulemaking.

Q. Well, did you make any recommendations for any improvement of the program?

[49] A. No, we——

Q. Took it as it was?

A. Right. We made comments on it.

Mr. DOUGHERTY. May I inquire, this was the comments in the listing document or in the critical habitat document?

A. Listing.

Mr. DOUGHERTY. Right. That's what I thought.

Q. The listing as of what date?

A. That was October 9, Thursday, October 9, 1975.

Q. The transplanting of fish is a very common practice, is it not, Dr. Williams?

A. The transplanting of game fish is fairly common, yes.

Q. Would it be fair to say that perhaps hundreds of species have been transplanted from one place to another?

Mr. DOUGHERTY. Are you talking about game fish?

Mr. PEDERSEN. Any kind of fish.

A. On a world-wide basis, I imagine it is close to that, yes.

Q. Hundreds of them?

[50] A. Yes.

Q. Can you give us some examples of these successful fish transplants from one area to another, some of which have been international, have they not?

A. Yes, pretty much. Carp is an example of, I guess, a successful transplant.

Q. Trout?

A. Some of the trout have been introduced widely.

Q. Salmon?

A. Some of the sun fishes, blue gill. Within this country some of the catfish have been fairly widely introduced.

Q. With respect to this program, I would ask you to look at this letter dated September 3, 1975, from the University of Michigan. Do you recall seeing that?

A. That is correct.

Q. And who was the author of that?

A. Dr. Robert Miller.

Q. He is a well-recognized national figure in ichthyology, is he not?

A. That is correct.

Q. I believe he is listed in the American Men of Science and other periodicals. What do you call them, other—other biographies of distinguished people; is that [51] not so?

A. Yeah, he is well-known.

Q. Do you know him personally?

A. Yes, I do.

Q. File that as Exhibit No. 12.

[Thereupon, the letter of September 3, 1975, was so marked and filed as Exhibit No. 12.]

Q. I hand you a copy of a letter dated September 15, 1975, addressed to Dr. Ronald O. Skoog from Thomas H. Ripley of TVA. Have you seen that letter before, Dr. Williams?

A. Yes.

Q. And that reports on some of the transplanting of darters into the Hiawassee River and also reports on finding darters below the Tellico Dam, is that correct?

A. Yes. It says above and below the carthen portions of the dam axis.

Q. And it also states that because of this the habitat is not restricted to the area of the river between Miles 5 and 17, is that not so, in the last sentence?

A. Yes.

Mr. DOUGHERTY. Exhibit 13?

Mr. PEDERSEN. Thirteen.

[Thereupon, the letter of September 15, 1975, was so marked and filed as [52] Exhibit No. 13.]

Q. On or about October 14, 1975, did you also have a meeting in Washington with various people from TVA, at which Mr.

Wallace and Ripley from TVA were present and Mr. Shriner and yourself were present? Do you recall that?

A. Yes.

Q. Do you have a filed memorandum or note regarding that conference?

A. No.

Q. You made no notes of that?

A. I made no report, no.

Mr. GARNER. When was that?

Mr. PEDERSEN. The meeting was October 14, 1975.

Q. Do you recall that one of the subjects brought up in the conversation was TVA's concern about not having received any comments about their conservation program?

A. I don't recall there being that much concern expressed about it.

Q. Was there also some discussion about the applicability of the endangered species act to this project?

A. There was some discussion about it.

Q. And you discussed the question of timber clearing again?

[53] A. I don't specifically recall that, but it could have been discussed, yes.

Q. Did they not at that meeting suggest that you were again invited to come to the area and draw your own conclusions about the timber cutting, if you felt it necessary?

A. Yes, I think I do recall that.

Q. But you did not go back again, as I understand.

A. That is correct.

Q. You were satisfied about the timber cutting problem, I take it?

A. Low on travel funds, seriously.

Q. But at any rate, you didn't accept their invitation and go back down?

A. No, I didn't.

Q. Did they also tell you that they had rediscovered the sharp-head darter on the Nolichucky River?

A. Yes, I believe they did.

Q. That species was thought to be extinct, was it not?

A. It was listed in one of the earlier editions of the Red Book as possibly extinct.

Q. Could you take a moment to look at this memorandum that I am handing you dated October 22, 1975, and read it through?

[54] Mr. DOUGHERTY. Could you tell me what memorandum that is, Mr. Pedersen?

Mr. PEDERSEN. This is a memorandum from Mr. Fitz to Mr. Chance, both in TVA, with respect to this meeting.

Mr. DOUGHERTY. Are you going to file this as an exhibit, and if not, I would ask that it be filed as an exhibit.

Mr. PEDERSEN. Yes. I wanted to let him read it first before I asked him questions.

A. All right.

Q. You have finished reading that?

A. Yes.

Q. Does that conform to your recollection of what transpired at that meeting?

A. In a general sort of way. Some of the impressions were not quite the same, perhaps, but generally those were the areas of the topics discussed.

Q. I would like to file that as Exhibit 14.

[Thereupon, the memorandum dated October 22, 1975, was so marked and filed as Exhibit No. 14.]

[Thereupon, a short conversation was held off the record.]

Q. I hand you another letter dated October [55] 17, 1975, from Thomas H. Ripley to Dr. Ronald O. Skoog. Do you recall having seen that letter?

A. Yes.

Q. This reports on discovering more darters below the Tellico Dam in the Watts Bar Reservoir; is that correct?

A. Yes.

Q. And also the finding of the sharp-headed darter on the Nolichucky?

A. That's correct.

Q. File that as Exhibit 15.

[Thereupon, the letter dated October 17, 1975, was so marked and filed as Exhibit No. 15.]

Q. And then here is a letter from Lynn Seeber, General Manager of TVA, to Mr. Lynn Greenwalt, dated November 20, 1975, in which it designates Dr. Ripley as TVA's liaison officer; is that correct?

A. That's correct.

Q. File that as Exhibit No. 16.

[Thereupon, the letter of November 20, 1975, was so marked and filed as Exhibit No. 16.]

Q. I hand you a copy of another letter dated December 1, 1975, to Dr. James D. Williams from Thomas H. Ripley. Do you recall receiving that letter?

[56] A. Yes, I do.

Q. File that as Exhibit No. 17.

[Thereupon, the letter dated December 1, 1975, was so marked and filed as Exhibit No. 17.]

Q. Now, this letter provided a good deal of information with respect to the hydrology of the river in sediment loads and the clearing operations generally; is that correct?

A. That is correct.

Q. Did you have any disagreement with any of the factual information furnished in that letter?

A. I didn't have any access to anything that would be contrary to this.

Q. Did it seem to be correct, just with your own knowledge of——

A. I am not a hydrologist. It is very difficult to evaluate.

Q. But so far as you know, it is correct?

Mr. DOUGHERTY. Well now, I object. I don't think there has been any basis for comparison or even evaluation, and I think that question is unfair to the witness.

Q. Well, after receiving that information did you request any other information or clarification of it at [57] all?

A. No, I don't recall.

Q. And another letter here dated December 11, 1975, to Dr. Skoog from Dr. Ripley, reporting on the finding of darters below Mile 0.2 and also reporting on seven transplants in the Hiwassee River; is that correct?

A. That's correct.

Q. File that as Exhibit No. 18.

[Thereupon, the letter of December 11, 1975, was so marked and filed as Exhibit No. 18.]

Q. Then, I have a document dated December 24, 1975, to Lynn Greenwalt from Ripley, Thomas Ripley, making application for a permit; is that correct?

A. That's correct.

Q. And it also included a copy of the snail darter conservation program.

A. I believe it did, yes.

Q. File that as Exhibit 19.

[Thereupon, the document dated December 24, 1975, was so marked and filed as Exhibit No. 19.]

Mr. DELLA VOLPE. It doesn't have the program with it as part of the exhibit.

Mr. PEDERSON. Well, we will get one of those later.

[58] Mr. DELLA VOLPE. I just wanted the record to be clear.

Q. It did include that, didn't it?

A. As I recall there was a conservation program with it, yes.

Q. Now, that interim permit was later granted, was it not?

A. Yes, it was.

Q. I will hand you here a document dated February 2, 1976, and ask if you can identify that. This is an internal memorandum recommending the issuance of the permit, is that correct?

A. That is correct.

Q. File that as Exhibit No. 20.

[Thereupon, the memorandum dated February 2, 1976, was so marked and filed as Exhibit No. 20.]

Q. Now, in that memorandum it stated that the population of the darter may be less than fifteen hundred, is that correct, under the conclusion part there, the first sentence?

A. Yes.

Q. That figure is no longer valid, is it?

A. I can't say. We have got a number of reports, but it is generally from our discussions on the [59] 14th of February, where we generally agreed that the population was probably more than fifteen hundred, yes.

Q. And was probably ten thousand or more; is that correct?

A. As I recall, it was somewhere in the neighborhood of ten thousand.

Q. Now, then, following that, on February 3, 1976, was a letter from George W. Melius?

A. That's correct.

Q. Acting Director to Dr. Thomas H. Ripley, granting the interim permit; is that correct?

A. That is correct.

Q. We will file a copy of that letter as Exhibit No. 21.

[Thereupon, the letter of February 3, 1976, was so marked and filed as Exhibit No. 21.]

Q. Then I will hand you a letter dated January 22, 1976, to Mr. Kenneth Black of the Atlanta office, from Thomas H. Ripley, with copy noted to Keith Shriner. You have seen this document before?

A. Yes.

Q. Giving an up-date report on the entire project?

A. That is correct.

Q. I would like to file that as Exhibit No. [60] 22.

[Thereupon, the letter dated January 22, 1976, was so marked and filed as Exhibit No. 22.]

Q. Then, I will hand you a copy of another letter dated January 30, 1976, to Dr. Ronald O. Skoog from Thomas H. Ripley, reporting on the sexual development and reproduction signs of the transplanted fish in the Hiawassee; is that correct?

A. That is correct.

Q. I would like to file that as Exhibit No. 23.

[Thereupon, the letter dated January 30, 1976, was so marked and filed as Exhibit No. 23.]

A. I might point out, that is showing signs of maturing reproduction or maturing gonads associated with reproduction.

Q. Do you recall, Dr. Williams, the meeting you had and the conference of February 14, 1976, in Nashville?

A. Yes.

Q. A large number of people were there including Gary Henry from your Atlanta office?

A. That's correct.

Q. Jack Chance from TVA, Jim Stewart from [61] your Norris office?

A. Yes.

Q. And Price Wilkins from the State of Tennessee and Gary Myers from Tennessee's Nashville office, Gary Hickman from TVA, Dick Fitz from TVA, and Dr. Etnier and Wayne Starnes, J. S. Ramsey from Auburn, and J. D. Williams, yourself, from Washington, and Bill Yambert from the State in Nashville?

A. Yes.

Q. Did you make any file memorandum on that conference?

A. Yes, there was a trip report on that.

Q. Do you have it available with you here now?

A. Yes. It wasn't in the stuff you went through this morning?

[Thereupon, a short conversation was held off the record.]

A. It is available.

Q. Would you make that file memorandum an exhibit to your deposition?

Mr. DOUGHERTY. Trip report.

A. Trip report.

[Thereupon, the trip report on the February 15, 1976, conference in Nashville was to be marked and filed as late filed [62] Exhibit No. 24.]

Q. Would you take a moment to read the document which I have just handed you which is two pages plus a list of those gentlemen?

A. Yes.

Q. Now, that is a filed memorandum dated February 19, 1976, from Mr. Fitz to Mr. Chance, is it not?

A. That's correct. It is signed by Fitz.

Q. From Fitz to Chance, yes.

A. To Chance, yes.

Q. Does that conform to your recollection of what transpired at that conference?

A. Those were some of the topics that were covered, yes.

Q. We would like to file that as Exhibit No. 25.

[Thereupon, the memorandum of February 19, 1976, was so marked and filed as Exhibit No. 25.]

A. There is one in there that I am not sure I would agree that that is exactly saying these were discussed, but this No. 8, "Dr. Etnier revealed that he played a primary role in determining the conditions of our interim permit." That is not quite the way we see it. That may have been Dick's interpretation of it.

[63] Q. All right. Now, just give us your interpretation of No. 8 then, please.

A. All right. It's a situation where we contacted, as far as we knew, everybody that had any firsthand knowledge, and so forth, of the permit or of the snail darter to comment on the permit, which was primarily Starnes, Etnier, the people from

the State and TVA. This was all done by phone on one afternoon, and that was about the extent of it. The way that reads, or the way one might interpret this as being we simply called him up and said, you know, what should we put on TVA's permit. It wasn't quite that way.

Q. With that revision you think it is a fair statement?

A. It corresponds fairly well to the topics, yes. It would look very much like the one I would file.

Q. Now, I hand you another letter dated February 18, 1976, from your Regional Director, Ray Vaughn, to Dr. Thomas H. Ripley. Do you recall seeing that?

A. Yes.

Q. Dealing with the Nashville meeting, is that correct?

A. That's correct.

Q. File that as Exhibit No. 26.

[Thereupon, the letter of February 18, 1976 was so marked and filed as Exhibit No. 26.]

[64] Q. Then, another letter dated February 22, 1976, from Lynn Greenwalt to Dr. Thomas H. Ripley, which would serve as an additional interim authority. Is that correct?

A. That is correct.

Q. We will file that as Exhibit No. 27.

[Thereupon, the letter of February 22, 1976, was so marked and filed as Exhibit No. 27.]

Q. Did you participate in the preparation of that letter, Dr. Williams?

A. In the interim authority?

Q. Yes. Additional interim authority, yes.

A. Yes. I didn't draft it, but I did have some input into it.

Q. And reviewed it, I take it?

A. I don't think I reviewed the final draft. It was simply comments as to what should be in it.

Q. All right. Then, a letter from Thomas H. Ripley to Mr. Harry Bray of the Tennessee Wildlife Resource Agencies, with copies to the Atlanta office, Morristown, Crossville, you in the Washington office, and William Yambert. Did you see that?

Mr. DOUGHERTY. What is the date of that, please?

Mr. PEDERSEN. This is dated March 2, 1976.

[65] A. Yes.

Q. And this is supplying the first bi-weekly report that was agreed upon at previous meetings?

A. That's correct.

Q. File that as Exhibit No. 28.

[Thereupon, the letter dated March 2, 1976, was so marked and filed as Exhibit No. 28.]

Q. Did you have an opportunity to review this bi-weekly report, Dr. Williams?

A. I went through it, yes, at the time we received it.

Q. Did you find it satisfactory for your purposes?

A. Yeah. It could have been a little bit clearer in certain areas, but generally it conformed with what we had agreed to.

Q. What you had in mind, yes. And if you felt it were deficient in any respect, I take it that you would have asked for further information?

A. Yes.

Q. Then another letter here dated March 9, 1976, from Thomas H. Ripley to Dr. Ronald O. Skoog dealing with the spawning of the darter; is that correct?

A. That's correct.

Q. You have seen that letter and reviewed it?

[66] A. Yes.

Q. File that as Exhibit No. 29.

[Thereupon, the letter dated March 9, 1976, was so marked and filed as Exhibit No. 29.]

Q. As a matter of curiosity, are you an expert on larval fish identification?

A. It's kind of hard to say, an expert. I have looked at quite a few larval fishes. As far as being able to recognize larval snail darters, I doubt if I could.

Q. Did you ever see any of them, larval snail darters?

A. No.

Q. Did you never go to TVA's laboratory in Norris and look at them?

A. No.

Q. They are extremely small, aren't they?

A. Quite small.

Q. You have to look at them with a microscope?

A. Well, all of the other darter larvae that I am familiar with are quite small.

Q. Another document here, a letter dated March 12, 1976, from Thomas H. Ripley to Kenneth Black of the Regional Office, with copy to Shriner and Skoog and others, have you seen that letter before?

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A. Yes.

[67] Q. File that as Exhibit No. 30.

[Thereupon, the letter of March 12, 1976, was so marked and filed as Exhibit No. 30.]

Q. The nature of this is that TVA asked for consultation on the disposition of about five hundred fertilized snail darter eggs, is that correct?

A. That's correct.

Q. Did you attend any such consultation meeting?

A. No. This was arranged by the regional office and was scheduled for the first of April. On discussing this further, the people in the regional office and the people they talked with at TVA felt that we could probably put this off a while, that it wasn't absolutely critical that it be held right now. So that was postponed.

Q. Is that one of the consultations that they said they would just prefer to handle by telephone?

A. I am not sure. As I recall, the Endangered Species specialists in the region said they felt we could have input by phone and answer some of the questions they had and let it go at that.

Q. Some of them are rather informal that way?

A. Yes.

Q. Depending on what the nature of the thing is?

[68] A. Yes.

Q. Then here is another letter dated March 12, 1976, from Thomas H. Ripley to Harvey Bray of the Tennessee Wildlife Resources Agencies, with carbon copies to many other people, including you. You have seen that before?

A. Yes.

Q. This is the second biweekly report as agreed upon, is that correct?

A. That is correct.

Q. Have you had a chance to review it?

A. Not in detail. It's in my hand box right now, but I just haven't gotten to it.

Q. If it is deficient in any respect you will let them know, I take it?

A. Certainly.

Q. File that as Exhibit No. 31.

[Thereupon, the Biweekly report dated March 12, 1976, was so marked and filed as Exhibit No. 31.]

Q. Another letter here dated March 18, 1976, from Harold W. Benson, Assistant Regional Director in Atlanta, to Thomas H. Ripley. I guess it is merely just confirming arrangements for a meeting to discuss the fertilized egg project; is that correct?

A. Correct.

[69] Q. We will file that as Exhibit No. 32.

[Thereupon, the letter dated March 18, 1976, was so marked and filed as Exhibit No. 32.]

A. That was the meeting that never was held.

Q. You never had the meeting?

A. That's correct.

Q. Are you planning to have it or has it gone too far?

A. That is up to the Regions. We made our recommendations over the phone as to what would be done with the fertilized eggs, larvae, and from there our Region personnel and the TVA personnel agreed that we would be in touch with each other to determine when the next meeting would be held.

Q. What is the problem there? Those eggs when they are hatched, you have to do something with them. Is that the idea?

A. I understand they are having trouble holding them, yes. So, probably to determine what could or should be done with them.

Q. Well, what would you do with them anyway?

A. Well, the recommendations were along the lines of putting them back in the Little T or back in a transplant site or if possible to maybe hold and try to develop techniques for holding until they get a bit larger. In [70] fact, I think probably my strongest recommendation of those three was that they try and hold and develop techniques to raise or to maintain these.

Q. You mean to hatch the eggs and raise the little darters?

A. Right.

Q. Try to make a little hatchery, so to speak?

A. Well, this is something there is very little known about, and rather than putting the fertilized egg or larval stage back out in the river, the chances of survival would be a little bit better if they were larger. So this was the idea, if they could

come up with a technique for holding these until they could get them up a little bit larger before we introduced them.

Q. Would that be something new in the field of ichthyology with eggs of this size?

A. No, there has been some work done with it in raising darters for genetic work, and so forth, and in crossing, but the techniques are not well developed for doing that.

Q. You couldn't just take those eggs and just dump them in the water, or can you, or is that part of the problem?

A. That wouldn't be a good idea, no.

[71] Q. They would have to be placed in there some special way down at the bottom?

A. Yeah. It would take some care. The eggs tend to adhere to things. So if you just dump them in, it would mean you would have to scrape them off some substrate, which would probably be enough to disturb them there to the point they wouldn't develop.

Q. Well, after the little darters grew up a litle bit can they then be transplanted successfully as little baby darters?

A. Yeah, more so than the egg.

Q. But not much is known about it now?

A. Not much at all.

Q. Then another letter here dated March 23, from Thomas H. Ripley to Harvey Bray of the Tennessee Wildlife, with copies to your Atlanta office, Morristown, your office, yourself, and various others. Have you seen this letter before?

A. Yes.

Q. Now, this is a report on the diving activities below Fort Loudon, is it not?

A. That's correct.

Q. And reporting that three more darters have been found in the Watts Bar Reservoir?

A. That's correct.

[72] Q. File this as Exhibit No. 33.

[Thereupon, the letter dated March 23, 1976, was so marked and filed as Exhibit No. 33.]

Q. In addition to reporting they found the darters, they reported they found the log perch there in the reservoir. Is the log perch a darter?

A. Yes, it is.

Q. Is it surprising to find a log perch in the reservoir?

A. Not at all.

Q. Other species of darters will survive in reservoirs, is that right? I am thinking of the river darter for one.

A. Yeah, I'm just trying to think in terms of numbers. There are some others, yeah.

Q. Several more?

A. A few.

Q. The names don't come to you right at the moment, I don't guess.

A. Well, yeah, the Percina Shumardi or the river darter would, log perch.

Q. And then there are a few others besides that?

A. That's just about it. That's all I can think of right off.

[73] Q. Now, another letter here dated March 25, 1976, from Thomas H. Ripley to Harvey Bray of the State Wildlife, and copies to various other people, including yourself. Have you seen this letter before?

A. Yes.

Q. Now, this is the third biweekly report that you agreed on at some other meeting, is that correct?

A. That's correct.

Q. You have not had a chance to review it, I guess.

A. No.

Q. You've got a backlog of correspondence?

A. Yeah.

Q. If it is not satisfactory and sufficient, you will ask for more information?

A. Certainly.

Q. File that as Exhibit 34.

[Thereupon, the Biweekly report of March 25, 1976, was so marked and filed as Exhibit No. 34.]

Q. Are there any other records, Dr. Williams, that you have that are important to this snail darter that we have not asked you about?

A. No, that pretty well covers it.

Q. Well, the long and short of it is, TVA [74] has done a pretty good job keeping you informed of what you wanted to know, have they not?

A. Yes. Subsequent to the listing it has been pretty good.

Q. They haven't tried to withhold anything from you?

A. Prior to the listing there was the transplant operation that we didn't find out about until after it was well under way, but subsequent to the listing, we have been kept well informed.

Q. Some of that transplanting was made before the listing, wasn't it?

A. That's right.

Q. When no permit was needed for it?

A. That's correct.

Q. That's what you're talking about?

A. Yes.

Q. The TVA just did that working with the State and other people, is that right?

A. Yes. Or at least we weren't contacted.

Q. But it was really before any permit was required from you people, wasn't it?

A. Yes.

Mr. PEDERSEN. That's all we have.

EXAMINATION

By Mr. DOUGHERTY:

[75] Q. Mr. Williams, you indicated that you had previously engaged in certain studies on three of the genera of the species, is that correct?

A. Three genera of the family?

Q. Yes.

A. Yes.

Q. And which family would we precisely refer to?

A. Family Percide.

Q. And which of the three genera did you precisely engage in a study of?

A. Well, I have done studies with all three of them, at least species that belong to all three of them.

Q. Have you engaged in any studies of the subspecies Imostoma?

A. The sub-genus Imostoma, yes.

Q. And I believe the Percina Tanasi is considered a part of the sub-species Imostoma?

A. Sub-genus Imostoma.

Q. Excuse me, sub-genus. Right?

A. Yes.

Q. What species in the sub-genus Imostoma have you engaged in the study of?

[76] A. Percina Quachitec is one. The comparison of that species to the new species, which we were describing from the upper part of the Coosa River System.

Q. Which at this point is unnamed?

A. That's correct.

Q. All right, have you also engaged in a study of the Percina Unaridea?

A. That was a very brief part of it. There are two other individuals working on that particular problem. So it was a brief comparison to make sure what we had was not Uranidea.

Q. Would you consider yourself an expert on darters generally?

A. I would, yes.

Q. And how long have you considered yourself an ichthyologist?

A. Well, I first started the pursuits of ichthyology in about 1962, in graduate school, and have been pretty active at it ever since.

Q. And I believe in the vita which has been made a part of this record as Exhibit 1, or Collective Exhibit 1, you have there listed a number of publications in your field.

A. Yes.

Q. Have you studied and examined most of the [77] material and information which was provided either by Dr. Etnier or Wayne Starnes or by TVA representatives in connection with the snail darter?

A. Yes, I have.

Q. Have you also reviewed the scientific document which has been published, written by Dr. Etnier bearing date of January 22, 1976, which is considered the scientific publication with regard to the Percina Imostoma Tanasi?

A. Yes, I have.

Q. And have you reviewed that document with some care?

A. Yes.

Q. And do you have an opinion as to whether or not the Percina Imostoma Tanasi is a new and distinct species?

A. Yes, I do.

Q. And what is that opinion?

A. I think it is a new species.

Q. Is there a particular darter which most closely resembles what we call the snail darter?

A. Yes.

Q. And what is that?

A. That would be Percina Uranidea.

Q. And where is that generally found?

[78] A. It is found west of the Mississippi River in Arkansas and Missouri.

Q. And isn't one of the habitats of the Percina Uranidea what we call the Ozark Rivers in Arkansas?

A. Yes.

Q. And is the habitat of the Percina Uranidea fairly similar to what we consider the critical habitat of the snail darter in the Little Tennessee River?

A. I haven't actually checked out there, but from the descriptions I have seen, yes.

Q. Aside from the helicopter trip which was referred to, I believe in March of 1975, have you actually physically been on the banks or in the Little Tennessee River and done some collecting of the Percina Tanasi?

A. Well, only once, and that was before the trial.

Q. That was before the hearing on February 25, I believe, 1976?

A. That is correct.

Q. And on that occasion did you specifically engage in collecting some of the snail darter specimens?

A. Yes. Wayne Starnes, Dr. John Ramsey, Dr. Etnier and myself.

Q. And were you able to collect some specimens of the snail darter?

[79] A. We caught one or two which were released back into the water.

Q. And where did you observe those specimens?

A. That was at Coytee.

Q. That was at Coytee Springs, River Mile 7?

A. That's correct.

Q. Have you generally observed, not only with the helicopter trip, but on the trip that you made on or about February 24, 1976, the general terrain location and sort of the character of the Little Tennessee River?

A. Generally, yes.

Q. And did you have occasion to observe the general nature of the river and the stream environment at River Mile 7 at Coytee Springs on February 24, 1976?

A. Yes, I did.

Q. Based upon the information which has been provided you by Dr. Etnier and Wayne Starnes, or by representatives of TVA, and based upon your experience as an ichthyologist, and your study of darters generally, do you have an opinion as to what should properly be considered the critical habitat of the snail darter?

A. Yes, I do.

Q. And what is that opinion?

A. That section we designated between 0.5 River Mile and 17 River Mile. That is, in my opinion, criti- [80] cal.

Q. And what criteria do you deem to be part of the essential critical habitat of the snail darter?

A. An area where the species inhabits; the area where it would feed, reproduce, live in general.

Q. I believe the actual listing was a document bearing date of October 6, 1975, which was published in the Federal Register, Thursday, October 9, 1975?

A. That's correct.

Q. I show you that document and ask you if you can identify that properly as being the document bearing the listing, disregarding my notation at the bottom of Exhibit A?

A. Yes.

Q. Is that the document which set forth the listing of the snail darter?

A. Yes, it is.

Q. As an endangered species?

A. Yes. Determines critical habitat for the snail darter. OK, yeah, the listing.

Q. I believe that's the listing.

A. Yeah, that's the listing.

Q. May we mark that as Exhibit No. 35?

[Thereupon, the listing document of October 6, 1975, was so marked and filed as [81] Exhibit No. 35.]

Q. Now, subsequent to that, a proposed rule making was set forth in connection with a determination of the critical habitat of the snail darter, is that not correct?

A. That's correct.

Q. And I believe there has been a specific determination by regulation published on Thursday, April 1, in the Federal Register by document bearing date of March 29, 1976, signed by George W. Melius?

A. That is correct.

Q. Indicating that the critical habitat of the snail darter is what?

A. The area between River Mile 0.5 and 17.

Q. I show you a document and ask you if this is the document which sets forth that determination of critical habitat?

A. Yes, it is.

Q. May we mark that as Exhibit 36.

[Thereupon, the document dated March 29, 1976, was so marked and filed as Exhibit No. 36.]

Q. Now, Dr. Williams, have you had occasion to be apprised of the manner in which the Little Tennessee River will be altered, assuming the Tellico Dam is completed and closed and the reservoir as proposed is created?

[82] A. Generally, yes.

Q. And have you been advised, for example, at River Mile 7 the depth of the reservoir in that area will be considerably more than it is now?

A. Yes.

Q. Possibly to a depth of twenty feet at pool level 813, or there abouts?

A. Not specifically those depths, but generally that the water would be twenty to thirty feet deep in that area.

Q. And when you observed it on February 24, 1976, there at River Mile 7, Coytee Springs, what did you observe to be the general level or depth of the stream at that point?

A. At that time it was up to about three or four feet deep.

Q. And did you observe the sandy or smooth gravel substrate in that particular area where you found the snail darter specimens?

A. Yes, I did.

Q. Dr. Williams, based upon the knowledge which has been provided to you by either Dr. Etnier, Wayne Starnes, TVA, or others, and based upon your experience as an ichthyologist and your experience and background with regard to the darters generally, do you have an opinion as to [83] whether or not the

creation of the Little Tennessee Reservoir or impoundment will have an effect on the critical habitat of the snail darter and also the snail darter itself?

A. Yes, I do.

Q. And what is that opinion?

A. The impoundment would drastically alter the critical habitat by eliminating current, resulting in sedimentation, silting out, which would alter to the point that it in all probability would not support snail darter population.

Q. Do you have an opinion as to whether such reservoir or impoundment creation will result in the extinction of the snail darter?

A. It certainly would in the pool area, I think.

Q. Do you have an opinion as to whether there is any significance to the finding of the snail darter specimens in the area within one thousand feet below the confluence of the Watts Bar Reservoir and the Little Tennessee River and at River Mile 4 and at River Mile 10, specifically being those numbered miles below the confluence?

A. I haven't really evaluated all of that yet at this point. I just got the documents that we received from TVA and, as I said earlier, I haven't really had a chance to go through it.

[84] Q. In view of your experience with darters and your experience as an ichthyologist, assuming that the Little Tennessee River is the basic habitat of the snail darter, is there any rational explanation for finding snail darter specimens in the Watts Bar Reservoir, as indicated to you?

A. Yes.

Q. And what rational explanation would you present?

A. I would offer the explanation that it is quite conceivable that they could be the result of washing downstream from the mouth of the Little T.

Q. The mere fact that the snail darter specimens have been found in the area, say, one thousand feet below the mouth of the Little Tennessee River or four miles downstream or ten miles downstream, does this in any way communicate to you that particularly in the numbers that were found, that those locations are any part of the actual habitat of the snail darter?

A. Well, it is habitat in the sense that they are found there and all, but over a long-range basis, it is difficult to say at this point.

Q. If I asked you the same question with regard to the mere fact that they were found in that location and in the numbers they were found, would that have any indication to you as to whether or not that was part of the critical [85] habitat of the snail darter specimens, if they were found, for example, in depths of water from eight to, let's say, twelve to fifteen feet?

A. Will you restate that?

Q. Would the mere fact that the snail darter specimens as indicated by TVA and in the numbers that they were found, would the mere fact that they were found in the locations indicated, that is within one thousand feet below the mouth of the Little Tennessee in the Watts Bar Reservoir, four miles below the mouth of the Little Tennessee River, and ten miles downstream, would that in any way communicate to you, assuming the depths in which they were found were, say, from eight feet to fifteen feet, that this was part of the critical habitat of the snail darter, knowing what you know about the fish thus far?

A. It would be difficult to say, based on what I know about it now. Not knowing anymore than I do about the substrate and current conditions, it would be difficult to say at this point.

Q. But at this point in time, in terms of the information which you have and the determinations which you have made, is it fair to state that the significant range of the critical habitat of the snail darter is primarily in the area from River Mile .5 to River Mile .17 of the Little Tennessee River?

[86] A. Yes.

Q. There has been some reference, Dr. Williams to a trip which you took in March of 1975, with representatives of TVA wherein you viewed the Little Tennessee River and adjacent areas by helicopter, and I believe that trip took place on or about March 14 of 1976. Did you subsequent to that trip have a telephone conversation with Mr. Ripley wherein Mr. Ripley made certain commitments to you with regard to the clear cutting operations in the area of the Little Tennessee River?

A. We discussed the clearing and he assured me that the measures they were taking in the areas they were clearing would be such that it would not result in any significant siltation.

Q. And at that time did the representatives of TVA, either by telephone, subsequent to the trip or during the trip itself, communicate to you that the cutting that was being engaged in or clear cutting, however you want to refer to it, was being done on a selective basis rather than wholesale clear cutting of all the bank areas up and down the Little Tennessee River?

A. They did indicate that the areas that were being cleared were away from the edge of the river; that the edge of the river, for example, wasn't being cut at this time.

Q. If you were advised that the areas [87] adjacent to the banks of the Little Tennessee River all the way down to the banks, all the way from the dam, that is the construction of the new Tellico Dam, all the way upstream towards Chilhowee Dam were being almost totally cleared, would this in any way concern you as far as an opinion concerning the effect of the clear cutting operations?

A. Yes.

Q. And why would that concern you?

A. Well, the wholesale clearing, particular the bank areas where you get some fluctuation of water level and where it is essential that the roots hold the soil on the bank, that removal of the vegetation would allow, perhaps, a lot more siltation to occur than would ordinarily occur.

Q. And why is it important to in some way restrict or limit siltation or sedimentation as much as possible into the Little Tennessee River?

A. Well, it affects, first and foremost, the snail darter particularly in the shoal areas where you have fair population that are at least feeding there, if not feeding and reproducing. You get a couple of problems associated with the silt. Just the physicial movement of the materials along tend to have somewhat of a grinding effect in cleaning the surface off. In addition to that, just the silting in of pockets in between the rocks and all, which is habitat for the darter.

[88] Q. Do you have an opinion as to whether or not such siltation or sedimentation could affect detrimentally the habitat and the critical habitat of the snail darter?

A. I don't know, having only seen it once. It is difficult to make any kind of a judgment on it, but certainly if it is very significant siltation, it would affect it.

Mr. DELLA VOLPE. Boone, for the record, what date was this we were talking about on this trip?

Mr. DOUGHERTY. I'm sorry, let's correct that. My references were to March 14. I understand it is March 24, 1975.

Mr. DELLA VOLPE. 1975? OK.

Mr. DOUGHERTY. That is when he made the trip with the TVA representatives.

Mr. DELLA VOLPE. You said 1976.

Mr. DOUGHERTY. Well, he did go visit the area at Coytee Springs on February 24, 1976.

Q. To what extent did TVA communicate with your office concerning the snail darter prior to the listing of the snail darter?

A. I guess the first time was when Tom Ripley and another gentleman came through here. It seems like it was [89] in the Fall of 1974.

Q. Do you recall who the other gentleman was?

A. Jerry—His first name was Jerry. I don't recall his last name.

Q. Was he with TVA?

A. Yes.

Q. All right.

A. Subsequent to that there was the information that I requested and received on the clearing operation.

Q. That was from Porter Taylor, was it not?

A. That's correct.

Q. Now, this was all prior to the listing?

A. Yes. And I believe that was it prior to the proposal that was published in the Federal Register.

Q. And, of course, TVA did provide comments in connection with the listing itself, didn't they?

A. Yes.

Q. Is it fair to state that the substance of TVA's comments or communications prior to the actual listing were by way of an effort to either avoid or delay the listing?

A. Restate the question, please.

Q. All right, is it fair to state that the primary communications that TVA made to your office prior to the actual listing were in substance of a nature to either avoid or delay the listing of the snail darter as an endangered [90] species?

A. I am trying to think of specific correspondence in reference to that. On the first trip through it was simply a discussion that we didn't have an awful lot of data and there wasn't very much known about it. Subsequent to that it was pretty much the same thing. Then the comment that came in asked that it not be listed. This is the comments that came in on the proposal.

Q. Did Mr. Ripley or any other representative with TVA communicate with you orally, by meeting with you in your office or with you here in Washington in an attempt to talk with you about possibly avoiding or delaying the listing of the snail darter?

A. I don't recall any meeting in the office.

Q. Now, Mr. Garner, your counsel, has handed you certain documents which purport to be apparently correspondence.

A. Yes.

Q. Are those documents which TVA has sent to your office?

A. That's correct.

Q. And do you have any documents there which are other than what Mr. Pedersen has referred to you and which have been previously made exhibits?

A. I believe so. This is the comments [91] received on our notice.

Q. May we file this as an exhibit, and I show you a document which is a series of documents dated August 15, 1975, and this is the documentation which TVA filed with the U.S. Fish and Wildlife Service in connection with the proposed listing of the snail darter as an endangered species?

A. Right.

[Thereupon, the documents dated August 15, 1975, were so marked and filed as collective Exhibit No. 37.]

Q. And I believe TVA also filed a document in connection with the proposed comments concerning the determination of the critical habitat?

A. That's correct.

[Thereupon, the document concerning the comments of the critical habitat was to be marked and filed as late filed exhibit No. 38.]

Q. Are there any other documents which you have in your possession which are, to make this simple and short, pertinent

to either the listing of the snail darter as an endangered species or which relate to the critical habitat determination or any program in which TVA is involved, transplant or otherwise, in connection with the snail darter, [92] other than what has been already introduced as exhibit?

A. No.

Mr. GARNER. Of course, for a point of clarification, there would be the administrative record, public comments, and all that sort of thing.

Q. Right. Excluding that?

A. There are none.

Q. Now, the environmental assessment has already been introduced as an exhibit, but we didn't have a copy of that. Am I correct in that?

A. Right.

Mr. DOUGHERTY. I have it Exhibit 5.

Mr. DELLA VOLPE. That's correct.

Q. Dr. Williams, do you feel like an ichthyologist could scientifically make a determination of critical habitat for a particular species, whether snail darter or otherwise, by merely flying over an area?

A. No.

Q. How many consultation meetings, or meetings that you referred to as consultations under the Act, have been held?

A. Just the one, the 14th of February.

Q. 1976, in Nashville?

A. That's correct.

[93] Q. That Mr. Pedersen asked you about?

A. That's correct.

Q. Was there anyone present other than the men that he listed?

A. No.

Q. And this was an effort to engage in an interagency consultation and also people who had been involved in the snail darter program?

A. That's correct.

Q. From the evidence you have been furnished concerning the proposed transplant program in the Hiawassee River, is there any evidence, definitive evidence at this point from the scientific point of view, that the transplant program is successful?

A. No.

Q. I believe on the trip that you made on March 24, 1975, with the TVA representatives, where you flew the Little Tennessee and part of the Tellico by helicopter you indicated that it had rained heavily the night before and part of that morning; in fact, your departure was delayed because of rain?

A. That's correct.

Q. And this would account for general turbidity in the streams in the entire area, would it not?

A. That's correct.

[94] Q. And it was difficult because of that to really evaluate the turbidity problem?

A. Yes.

Q. A minute ago you were asked by Mr. Pedersen about the trouble holding the eggs. Are these TVA representatives who referred to holding the eggs?

A. Yes.

Q. And where were they holding these eggs?

A. At Norris, Tennessee.

Q. And do you know in what sort of facility or holding area they were holding the eggs?

A. They described it generally, yes.

Q. And had these eggs been fertilized?

A. Yes.

Q. And were they fertilized in artificial areas, so to speak?

A. I understand they were, yes.

Q. In asking you the questions which I previously asked you about the transplant program, and in asking you about the information with which you have been provided, have you also been advised in connection with that information that the representatives of TVA had found what they called two Ichthyko Plankton, which were from the Percid family?

A. Yes.

[95] Q. Were you in any way advised whether those two specimens of Ichthyo Plankton were from the snail darter?

A. No.

Q. And when we say or use reference to the Percid family, we are merely talking about the perch family, are we not?

A. That's correct.

Q. And are there a number of other representatives from the perch family?

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A. Yes, there are.

Q. Would Percina Shumardi also be within that family?

A. Yes.

Q. And is it part of the sub-genus Imostoma which has some similarity, though not as much as the Uranidea to the Tanasi?

A. That is correct.

Q. And does not the Shurmardi have more, so to speak, ability to survive in rather difficult surroundings, such possibly as reservoir surroundings?

A. Yes, that's correct.

Mr. DOUGHERTY. I believe that's all.

RE-EXAMINATION

By Mr. PEDERSEN:

[96] Q. What is your opinion, Doctor, as to the prospect of finding the snail darter elsewhere?

A. Very slim.

Q. Very slim?

A. Yes.

Q. And if it is found elsewhere, would you have to revise your judgment about its survival in the new reservoir?

A. Depending on where it was found.

Q. Yes.

A. If it were found in another stream or flowing water condition, I wouldn't.

Q. Or in other reservoirs?

A. If it was found in another reservoir, that would have some effect on it possibly, yes.

Q. You don't have any closed mind on that, do you?

A. No.

Q. You think that TVA is doing the right thing by exploring elsewhere to see if it exists elsewhere, don't you?

A. Yes, definitely.

Q. You don't consider all of that effort to be in vain and a waste of money?

A. No.

[97] Q. Now, so far as the clearing is concerned, you understand and observed, do you not, that the roots of the trees are not torn up, the tree is simply cut off at ground level, or shortly above the ground level, is that correct?

A. Once the stump dies, then you don't have the small roots to hold the soil there. So there is some loss of soil that results from that.

Q. Now, of course, the rotting of roots, that is going to take a long time, is it not?

A. For the entire stump to go, yes. But the small root hairs and small structures that helps hold the soil go fairly rapidly, if not nourished.

Q. Now, in areas that are close to the bank, the TVA is seeding and mulching that, are they not?

A. I understand that they are.

Q. Do you think that is a proper thing to do there?

A. That certainly helps the situation.

Q. The fact is, really, you never have seen any of TVA's activities that threatens the existence of the darter, have you?

A. When I was down for the hearing, I did see the area that was cleared there in the vicinity of Coytee Springs, and there was some erosion of the bank along the edge of the river there.

[98] Q. Do you have any notion at all as to how many gallons per minute flows across the bed of this river, Dr. Williams?

A. Not right off, no.

Q. Do you have any question at all that with the amount of water, the cubic feet per second, and it's approximately two million, five hundred thousand gallons of water every minute, do you have any question that that is adequate to keep the floor of the darter clean as it has in the past?

A. It may keep it clean, but some of the problem is associated with silt. It is not just a clean bottom. It's the fact that as the soil particles are being pushed along, it has a grinding effect or a grating effect on the bottom. That would be one of the problems.

Q. Isn't it a fact, Doctor, that the silt today, with all of the TVA's activities, is only about a third of what it was before upstream dams were built?

A. I couldn't answer that.

Q. If that were true, would that change your opinion about that?

A. If it were a third of what is used to be?

Q. Yes.

A. Yeah, I think that would probably change it.

[99] Q. And if it were true that the silt load today is approximately two hundred and fifty-four thousand tons a year and prior to the dam's being built upstream it was about eight hundred thousand tons per year, wouldn't that satisfy you that the TVA's activities there is absolutely insignificant?

A. I wouldn't say insignificant, but again, it would depend on duration and amount, the time of the year and things like that would enter into it.

Q. You don't seriously think that there is any danger out there, now, do you, or you would be out there examining it, wouldn't you?

A. I don't think there is any likelihood that it's going to bring about the extinction of it in the immediate future.

Q. Don't you know that TVA is willing to take you out there any day or hour you want to to see if you have any questions about it?

A. Certainly.

Q. You have never requested that they do take you out there, have you?

A. No, I haven't.

Q. And you have never requested anything from them that they have not furnished, have you?

A. That's correct.

[100] Q. And you don't think there would be any question about it if you wanted to go out there tomorrow, but that they would take you?

A. Certainly.

Q. Now, the same about the consultation meetings. You say you have only had one formal meeting?

A. That is correct.

Q. Do you consider your telephone conversations with Dr. Ripley and Fitz and Chance as consultations?

A. Not under the guidelines that are being prepared. This would not fall under that, no.

Q. But the fact is, there are no guidelines, isn't that the problem?

A. I understand they have been drafted but haven't been released or released just recently.

Q. Now, you don't expect TVA to comply with guidelines that aren't even in existence, do you?

A. They were in on the drafting of those, so I would think they would be aware of some of it.

Q. Have you ever asked for any consultation that TVA has not been willing to comply with?

A. No, I haven't.

Q. Has the Regional Office ever asked for any consultations that TVA refused to comply with?

A. Not to my knowledge.

[101] Q. TVA has asked you for comments on its various aspects of the program, have they not?

A. That's correct.

Q. Have you given them any information?

A. Through the publications and the Federal Register.

Q. Well, I mean in conversation and in consultation?

A. In conversations over the phone, yes.

Q. Do you consider that consulting with TVA?

A. Again, not in the strict sense as it is provided for in the Act.

Q. But isn't it you that has been the guilty one of not consulting, and not TVA? They have asked you to consult and you have done nothing; right?

A. They have asked us to enter into consultation, and I think with the meeting on the 14th we did initiate consultation.

Q. And they have asked you to consult about their program and you have not; isn't that so?

A. They have asked for our comments.

Q. Isn't that consulting with you?

A. You might interpret it as that.

Q. Well, I mean, don't you interpret it that way, to be fair now?

[102] A. Not in the sense of the Act, no.

Q. You mean if TVA asked you to consult and you just sat there and don't do anything, that TVA is at fault?

A. No, if they ask to enter into consultation, which they have, and we initiated consultation on the transplant operations the 14th of February, but that is the only aspect that we have entered into consultation on at this point.

Q. But, now, they have asked you several times to comment on their conservation program and you haven't done anything, have you?

A. Again, not other than reply to it in the Federal Register.

Q. Well, now, do you fault TVA for that, as being guilty of not consulting with you?

Mr. GARNER. I object to that. I don't think it is a question of fault at all.

Q. Well, do you find TVA guilty of not consulting with you?

A. It is kind of hard for me to judge that because I know the guidelines are being drafted and in that sense, it is something that I—I don't know. That would be hard to say.

Q. Now, didn't you know that your Atlanta office called TVA just the other day and said, "We don't need to come down there and consult in a formal meeting. We can [103] consult on the telephone"?

A. Yes.

Q. Does that accord with your idea of what consulting is?

A. In that case, it is, yes.

Q. Well, I don't mean to talk about legal niceties. I am talking about good faith in getting together and discussing things.

A. Well, TVA has always been very open in offering to get together, yes.

Q. Been more than willing at any time, haven't they? Haven't they assured you they were willing?

A. Certainly, they have assured us that they will meet at any time.

Q. At any time, any place; isn't that true?

A. That's true.

Q. And you have never asked them to meet any time when they have refused to meet with you, have you?

A. No.

Mr. PEDERSEN. I have nothing further.

Mr. DOUGHERTY. I have nothing further.

And, further, the deponent saith not.

JAMES DAVID WILLIAMS, Sr.

[EXHIBIT 12]

THE UNIVERSITY OF MICHIGAN
ANN ARBOR, MICHIGAN, U. S. A. 48104

DEPARTMENT OF ZOOLOGY

September 3, 1975

Dr. James D. Williams
Office of Endangered Species
Fish and Wildlife Service
U. S. Department of the Interior
Washington, D. C. 20240

Dear Jim:

I am not as close to the snail darter problem as I would like to be in order to make sound comments on the TVA "Program to Conserve the Snail Darter."

This program certainly appears to be thoroughly detailed (almost too much so), even to the point of redundancy in that Activity 1, to determine life history and ecology, and Activity 4, the physical and biological characteristics of habitat, seem to be much the same!

Much of the argument about the scientific status of the snail darter seems to me to be irrelevant since I understand that the Secretary of the Interior has the authority to designate, as endangered or threatened, distinct genetic populations whether they represent full species or lesser taxa.

TVA states they began in 1974 on an extensive program to conserve this fish. Surely by now, tangible results should have become available. Consequently, I am troubled by the fact that this document contains no information on the fate of one transplant (into the Hiwassee River) made many months ago or of the efforts (by TVA and University of Tennessee biologists?) to locate additional populations of the snail darter. TVA claims that the snail darter cannot be shown to exist only in the Little Tennessee River. Have they found evidence that it does indeed exist elsewhere? Their conclusion seems to be based entirely on Dr. Raney's opinion. His testimony admittedly makes difficult the chance of getting the snail darter listed as an endangered species. The fact that Ed Raney has not actively studied the darter group in question for many years is of course, not taken into consideration by TVA.

TVA claims that Charles R. Hazel is a well known ichthyologist. Frankly, I never heard of him and can find no record of publication by him. Clearly he is an environmentalist rather than an ichthyologist.

If it cannot be demonstrated (as I think should be possible by now) that the snail darter occurs outside the lower Little Tennessee River, then TVA's case loses much of its strength. Their Activities 7 and 8 (the holding and propagation of this fish), which they say should be available as needed for a later date, should be undertaken now if it cannot be shown that this darter occurs elsewhere.

Dr. James D. Williams - page 2

I am troubled by this proposal since some critical answers, which it seems to me should have been available before now, are not given. Would giving the species Threatened status be a solution to this biopolitical problem? It is hard to pick holes in the TVA program although we may have mixed feelings about its success.

Sincerely,

Robert R. Miller
Curator of Fishes

RRM:mbp

[EXHIBIT 64]

64

TELLICO PROJECT

CONSTRUCTION STATUS AND FUNDS OBLIGATION

(THROUGH MARCH 31, 1976)

Activity	Estimated Projected Cost ($000's)	Funds Obligated ($000's)	Schedules Completion Date	Percentage Completed
Land Acquisition	$ 26,000	$24,753	June 1976	99
Main Dam, Spillway, and Auxiliary Dams	17,400	16,429	Jan. 1977	85
Reservoir Adjustments, Clearing, and Rim Treatment	35,000	23,430	June 1977	68
Interreservoir Canal, Channel Improvements, Public-Use Facilities, and Other Structures	8,600	613	Dec. 1977	5
Construction Plant, Equipment, and Inventories	-	339		
Construction Supervision and Services, General Engineering and Design, and General Administration	13,000	10,043	Dec. 1977	77
Total Expenditures	100,000	75,607	Dec. 1977	80
Changes in Unpaid, Undelivered Orders		3,011		
Total Obligations	$100,000	78,619		

OEDC
Costs and Estimating Staff
April 27, 1976

BEST COPY AVAILABLE

[EXHIBIT 66]

TELLICO

PROJECT: ADJUSTMENTS, CLEARING, AND FISH TREATMENT — COMPUTED BY: — DATE: 4-27-76

	Acquisition (000's)	Design (000's)	Water Management (000's)	Total (000's)
		$ 2,350	$ 495	
Federal and State Highways	$ 4,361			
Monroe County Roads	7,135			
Tributary Roads	355			
Loudon County Roads	2,125			
Tributary Roads	48			
Blount County Roads	—			
Railroads, Monroe Co.	17			
Loudon Co.	—			
	$ 14,041	$ 2,450	$ 495	$ 16,979

FILED 3-26-76 — EXHIBIT 66

207 RELOCATING RAILROADS AND RAILROAD BRIDGES

	Acquisition (000's)	Design (000's)	Water Management (000's)	Total (000's)
		$ 158	$ 9	
Approaches (L & N)	$ 1,100			
Bridges (L & N)	2,357			
	$ 3,457	$ 158	$ 9	$ 3,624

207 RELOCATING AND PROTECTING OTHER STRUCTURES AND IMPROVEMENTS

	Acquisition (000's)	Conversion Projects by (000's)	Water Management (000's)	Total (000's)
		$ 50	$ 155	
Power Facilities	$ 13			
Communication Facilities	23			
East. TN. Natural Gas Co.	1			
	$ 211	$ 50	$ 155	$ 5

TELLICO

PROJECT: ADJUSTMENTS, CLEARING, AND FISH TREATMENT — COMPUTED BY: — DATE: 4-27-76

	Acquisition (000's)	Design (000's)	Water Management (000's)	Total (000's)
		$ 371	$ 112	
Clearing	$ 526			
Fish Treatment	95			
Archeological Protection	2			
	$ 623	$ 371	$ 112	$ 314
	"01, "06, "07, "09		Subtotal	$ 11,411
			Contingencies (11% of $18,355)	2,019
			TOTAL	$ 23,430

OEDC
Costs & Estimating Staff
April 27, 1976.

TELLICO No 1

COMPUTED BY [illegible] DATE 4-27-76

CHECKED BY [illegible] DATE [illegible]

204 RECREATION ROADS & BRIDGES [illegible]

			TOTAL
		TOWN AND STATE ROADS	
2106		US Hwy 411	907
2113		U.S. 129 @ Hackney	14
2114		U.S. 129 - S. Harrison	25
2115		U.S. 129 - N. Calhoun	19
2116		U.S. 129 @ Calhoun	3
2120		Hwy 72	914
2121		U.S. 411 Bridges	1,386
2126		Hwy 39 Bridges	75
			$ 3,361
		MONROE COUNTY ROADS	
2014		E. Notchy Knobs	
2016		Bealah - Lindsay Bridge	$ 106
2017		Tomotla - Bealah Creek	87
2026		Bealah - Tarlton	859
2027		Citico - Calhoun's / Mulberry Creek	944
2035		Foster's Creek - S. Unicoi	23
2050		Notchy Knobs	212
2054		Foster Bridge - Wolf Creek	185
2059		Citico - Jackson & Peachtree Branch	312
2036		Vic. Notchy Knobs	41
2039		Mt Zion - Morgan & Co.	190
2044		Bealah Creek - Citico Road	12
2047		Vonore - Tomotla	1,165
2049		Bacon Road	4,739
2051		Bat Creek & Hwy 72	21
2052		Lamarche - Coughran Cem. - South	5
2053		Tomotla Creek Road	7
2056		Cherokee - Branch	756
2055		Notchy Creek	21
2056		Howard Chapel	441
2057		Old Hwy 72	270
2058		Middle Branch	21
2059		Diamond Branch	4
2060		Miller Branch Road	4
			75
			$ 2,182
		MONROE COUNTY TERTIARY ROADS	$ 255

TELLICO

COMPUTED BY [illegible] DATE 4-27-76

CHECKED BY [illegible] DATE [illegible]

204 [CONTD]

			TOTAL
		LOUDON COUNTY ROADS	
3103		Tellico Road at Valley Cemetery	$ 5
3116		County Road 111 on Hwy 95	6
3117		Sinking Creek	11
3121		Tellico Road - Bacon Creek to Sinking Creek	1,991
3122		Gap Road	191
3035		Hamilton Ferry	2
3018		Watkins Lane	2
			$ 2,208
		LOUDON COUNTY TERTIARY ROADS	$ 48
		BLOUNT COUNTY ROADS	
		BRIDGE TERMINALS - MONROE COUNTY	$ 17
		LOUDON COUNTY	$ 11
		TOTAL 96.2	$ 14,056

* DISTANCE CARRIED W/O C.F.

DEDC
COSTS & ESTIMATING STAFF
APRIL 22, 1976

March 2, 1976

Mr. Harvey Gray, Director
Tennessee Wildlife Resources Agency
Post Office Box 40747
Nashville, Tennessee 37234

Dear Harvey:

As agreed upon at the interagency consultation meeting in Nashville, February 14, 1976, and stipulated in Director Greenwalt's letter of February 23, 1976, we are submitting the enclosed report as documentation of progress in TVA's snail darter conservation program through February 14, 1976. Further progress reports will be submitted on a biweekly basis.

Sincerely,

Thomas H. Ripley, Director
Division of Forestry, Fisheries,
and Wildlife Development

EBF:CDR
Enclosure
CC (Enclosure):
Mr. Gary Henry, USFWS, Atlanta
Mr. Harold Horst, TVRA, Morristown
Mr. Reid Yatsu, TVRA, Cressville
Dr. James Williams, USFWS, Washington, D.C.
Mr. D. William Yambert, TVRA, Nashville

Same Letter Sent To:

Mr. Nal D. Boles
U.S. Fish and Wildlife Service
Tennessee Valley Authority
Forestry Building
Norris, Tennessee 37828

3/4/76--CD
CC: Mr. Robert Jones, Jones & Stokes Associates, Inc.
Dr. Edward C. Raney, Ichthyological Associates
H. S. Swingle, Jr., 429 NSB-K

PROGRESS REPORT
THROUGH FEBRUARY 14, 1976

PROGRAM TO CONSERVE THE SNAIL DARTER
PERCINA (IMOSTOMA) SP. NOV.

Tennessee Valley Authority

Division of Forestry, Fisheries, and Wildlife Development

Norris, Tennessee 37828

HABITAT

The habitat in which snail darters have been observed and/or collected in the greatest abundance is the swift current areas (~2fps) over gravel sand substrate in water six inches to three feet deep in the lower Little Tennessee River. Substrate samples, current velocity measurements, benthos samples, and macrophyte samples are being collected in order to better describe the preferred habitat of the snail darter. A map with overlays to show depth, current velocity, population density areas, and substrate types is also being constructed.

In December 1975, 73 young-of-the-year snail darters along with 10 adults were located below Tellico Dam in the Little Tennessee River. The habitat below Tellico Dam differs from the Coytee Spring area in that the average depth is 27 feet, compared to 3 feet in the Coytee Spring area. Water velocity is approximately 2 feet per second along the bottom in this area. The substrate is composed of relatively silt-free gravel and sand to approximately 400 yards downstream from the dam. From that point to the mouth of the river, a silt covering of the substrate increases proportionately to distance from the dam. No snails were observed in this deep water habitat, but some mayfly larvae and leeches were seen.

Substrate samples were taken along predetermined transects using a substrate "scoop." The "scoop" is a modified coal shovel used to collect a defined amount of substrate (one square foot). The samples are then returned to the lab for analysis with the use of different sized sieves to separate the substrate components. Using volume displacement, each component can be expressed as a percent of the total.

3

SNAIL DARTER LIFE HISTORY

There is only moderate literature on darter life history, and the only documented statement about the life history and ecology of the snail darter is an unpublished report by Wayne C. Starnes (1975). From this report and subsequent observations made by the Division of Forestry, Fisheries, and Wildlife Development's staff, a matrix of life stage and habitat influencing parameters is being constructed. A tentative life history model is given in Figure 1 identifying life cycle stages in a flow diagram related to general habitat types. As more data are obtained, they will be added to the matrix; and the life history model will be modified if necessary.

Seasonal relative abundance estimates are being made for all species at Coytee Spring and five other locations in the Little Tennessee River. The estimates are being made by four divers swimming transects (15' x 50') marked off by highly visible cord. Each diver uses a 45-inch fiberglass pole, which is connected by a few links of chain to the adjacent diver's pole. The poles aid in keeping proper intervals between the divers along with chasing the fish off the bottom for better observation. Estimates are made for each habitat type on three different dates per quarter at all stations in the Little Tennessee and Hiwassee Rivers. Five transects are made per habitat type. From the data available, it appears the Coytee Spring and Toliver Island areas had the largest concentrations of snail darters during the winter quarter (Table 1). Coytee Spring area had an average of 1.1 darters per transect run compared to 1.0 per run at Toliver Island.

352-881 O - 78 - 33

Current velocities are being measured at the Coytee Spring area during both regulated high and low flows using a pigmy current meter. Approximately 100 measurements will be made over the different substrate types at 0.8 of the depth from surface. These points will be plotted as isovels at 0.25 fps intervals on base maps for mean peak and trough regulated discharges.

Benthos samples are being taken quarterly at five study areas in the Little Tennessee River and one study area in the Hiwassee. A dome sampler similar to the one described by Gale and Thompson (1975) is being used to collect the benthos samples. Five sample stations with three "discernible habitat types" each are sampled at both of the prime areas (Coytee Spring and Hiwassee transplant sites). Four other areas of the lower Little Tennessee River have one sample station each. Three samples of each DHT are being collected per station and returned to the lab for analysis.
The winter quarter samples have been collected and analyzed. Macrophyte samples have also been collected, but analysis is not complete.

Plots are being made of each of these aspects of habitat as overlays on a base map. Another overlay is being constructed for seasonal abundance of the snail darter which, in conjunction with the habitat overlays, will allow a detailed description of optimum snail darter habitat seasonally.

4

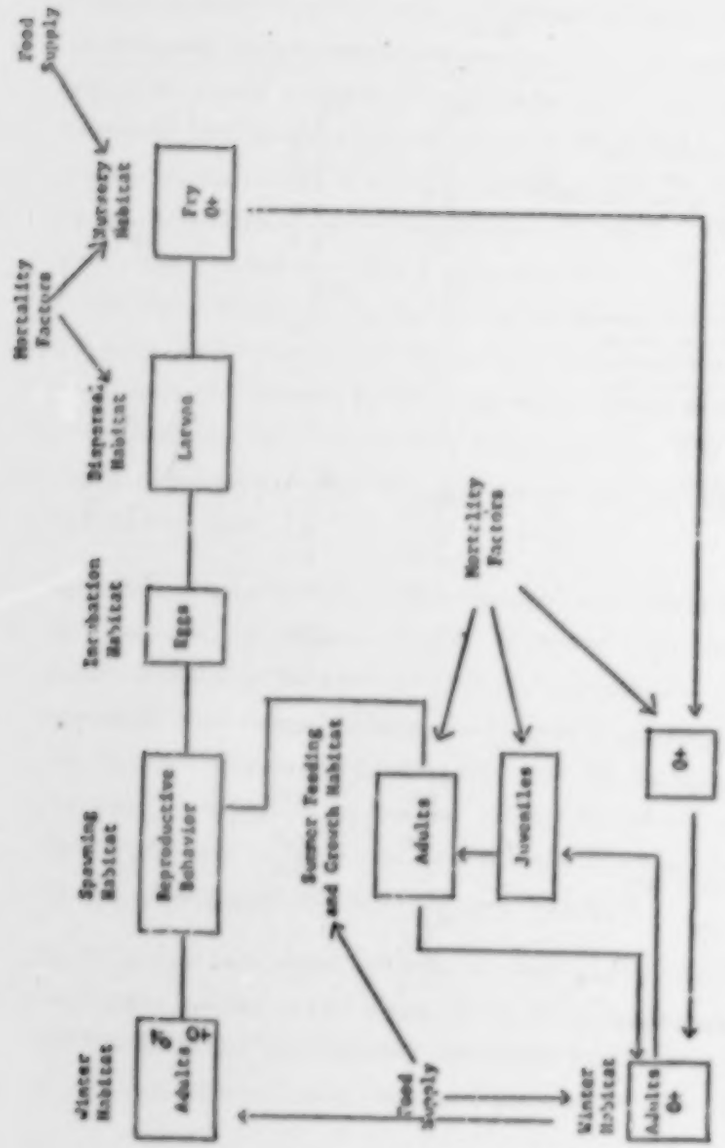


FIGURE 1. SNAIL DARTER LIFE HISTORY MODEL

5

TABLE 1. WINTER RELATIVE SMALL DARTER ABUNDANCE SAMPLES LITTLE TENNESSEE RIVER, 1976

Location	Date / Mean Number/Transect		Winter Mean
Coytee Spring	1/7	2/5	
Between Is. & Gravel Bar	1.2	1.0	-
Below Gravel Bar-right	0.7	1.0	
Upper Gravel Bar-left	0.2	0.2	
Low & below Gravel Bar-left	3.6	1.4	
Midstream-below Gravel Bar	-	0.8	
Overall Mean	1.5	0.8	1.1
Toliver Islands	1/7	2/6	
Between Middle & Lower Is.	0.6	2.6	
Lower Is.-right-above	-	1.6	
Lower Is.-right-upper	1.0	1.2	
Lower Is.-right-middle	0.4	0.6	
Lower Is.-left-upper	-	0.2	
Overall Mean	0.6	1.2	1.0
Benthos Stations	1/12	2/9	
River Mile 4	2.0	0.2	
1	0.6	0.8	
2	0.6	0.4	
3			
Overall Mean	1.07	0.5	0.8
Davis Ferry	2/10	2/11	
1	0.8	0.2	
2	0.0	0.0	
3	0.2	-	
Overall Mean	0.3	0.1	0.2
Morganton Ferry	2/5	2/11	
1	0.0	0.0	
2	0.2	0.0	
3	0.0	0.0	
Overall Mean	0.1	0.0	0.1
Davis Island	2/11		
1	0.0	-	
2	0.0	-	
3	0.4	-	
Overall Mean	0.1	-	0.1

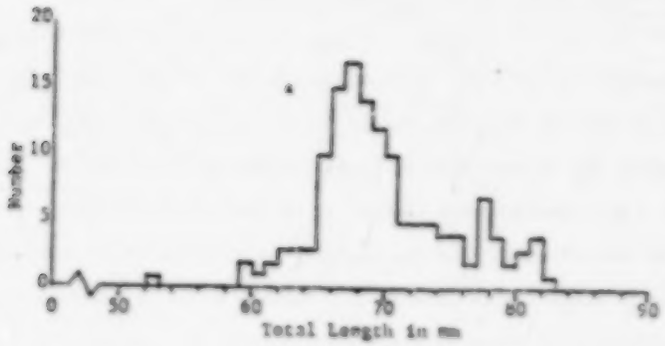
6

In the process of collecting sympatric fish species of the Little Tennessee for food habit studies, several small darters have been captured. Total lengths and outward appearance of reproductive stage (free-flowing and tubercules) were checked before returning them to the river. Length frequency of darters collected during the first two weeks of December from the Coytee Spring area show no young-of-the-year fish and only one age I darter (age I darters were thought to be about 50 mm in total length based on data from Starnes) with the majority of the population being 65 mm or greater in total length (Figure 2). Several 45-50 mm small darters have been collected at River Mile 4.0 recently and are considered to represent young-of-the-year fish. In addition, 75 small darters, 40 mm in total length, and several adult fish have been observed below Tellico Dam in 25-30 feet of water.

The large year class now prevalent in the small darter population is the 1973 year class. During March and April of 1973 and 1974 there were low average discharge rates (5,895 cfs-5,700 cfs, respectively). However, in February 1973 the average discharge rate was very low (7,383 cfs) compared with the same period in 1974 (11,289 cfs). This information, the apparently poor 1974 year class, and the fact that the fish are spawning this year (1976) in February is fairly conclusive evidence, in our opinion, that the fish normally spawn during February and early March.

The sex of each small darter collected has been noted to determine the sex ratio. From November to late January in the Coytee Spring area there were 1.09 females to male small darters. The overall population of small darters in the Little Tennessee River exhibited a ratio of 0.96 females to male

FIGURE 2. Length frequency of snail darters, Coytee Spring, December 1973.



6

darters. Beginning in late January through mid-February, the sex ratio changed to 0.3 female to male snail darters at the Coytee Spring area. It is possible that the female darters have moved to the deeper areas of the river prior to spawning where there is less current.

Male snail darters approached high breeding condition in December having become free-flowing in November and developing tubercules on the anal fin by early December. By late January the head region and caudal fin had become tuberculate, and the throat region had also darkened considerably except for two light irridescent blue patches on the branchiostegial region. The females showed no signs of approaching breeding condition until mid-January, when they became very heavy with eggs. By mid-February some females collected were free-flowing. Eggs could be obtained from almost all females, but only a few were actually ready to spawn.

An attempt is made to collect 15 specimens of each sympatric fish species (excluding snail darters) per month for stomach sample analysis. These fish are collected by seining or electrofishing using a boat-mounted DC electroshocker during high flows. Stomachs are removed from larger fish and placed in a 30 percent formalin solution, while the smaller specimens are preserved whole and returned to the lab for analysis. The results will be used to define the degree of competition and predation.

All behavior analysis is being done through observation by the divers. During moderate flows (approximately 3,500 cfs), the darters attempt to wedge themselves between small rocks or burrow under rocks to avoid the current. There is very little feeding activity during these high current velocities. At low flows (approximately 1,400 cfs), the snail darters

appear to feed often while moving upstream, stopping every three to five feet to locate food. The darters often turn over small rocks to expose the underside and pick off food organisms (mainly snails).

Several male snail darters on separate occasions in mid-February were observed attempting to swim head first under smooth surfaced rocks (approximately three inches in diameter) that were slightly elevated on one edge and situated over sand or sandy gravel substrate. This caused the formation of a temporary small depression in the sand under the elevated edge of the rock, which was then abandoned. A female snail darter was observed on a single occasion to swim over a similar type of rock and come to rest in the sand nearby. She then iobedded her pectoral fins into the sand and proceeded to back herself under the rock by removing the sand behind her through body and tail movements. These separately observed and uncharacteristic behavior patterns suggest, due to the high gonadal development state of the fish at the present time, that spawning may take place in the sand, or sandy gravel substrate, under rocks.

No territorial behavior has been observed for snail darters. They have been seen in close proximity to several different species of fish with no apparent aggressiveness. Adult and young snail darters have also been observed in groups of two to four fish with no aggressive behavior exhibited.

On February 9 and 10, 1976, a total of 7 female and 12 male snail darters were collected from the Coytee Spring and Toliver Island areas of the Little Tennessee River. These fish were stripped of eggs and milt to be

used in an attempt to rear larval snail darters for positive identification. Since Percina shumardi is also nearing spawning condition, we will attempt to rear its larvae for comparative purposes.

On February 9, 5 females and 10 males were stripped of eggs and milt into a two-gallon plastic bucket. All fertilization operations were carried out within one hour of capture, and the eggs were then transported to the lab and placed in a "living stream." The "living stream" is a large circular tank filled with spring water and equipped with a cooling and aerating unit which maintains a constant temperature and recirculates the water throughout the tank.

A different procedure was used on February 10, where only two female and two male snail darters were stripped of gonadal products. Each female darter was stripped into a petri dish half filled with water from the Little Tennessee. One male was then used to fertilize one of the two females. The fertilized eggs were transported to a facility at Norris Dam and placed in incubation trays.

Twelve adult snail darters, four females and eight males, were collected from the Coytee Spring area on February 10, 1976, and transported to the lab and placed in "living streams" for spawning behavior observations. These units contain substrate collected from the Coytee Spring shoal and are filled with Little Tennessee River water. To avoid disturbance from the cooling and recirculating unit, a separate "living stream" is set up as a reservoir of cooled water. Small pumps in each unit provide current simulating the stream condition. The fish and eggs are observed periodically 24 hours a day to document spawning behavior and egg development.

II

SEARCH FOR POPULATIONS OF THE SNAIL DARTER IN OTHER RIVERS

A total of 43 river systems including 120 sample sites has been inspected for snail darter populations and similar habitat to that of the Little Tennessee River. A habitat search evaluation form has been filled out for each sample site, including information on habitat characteristics and species composition. Each sample site has also been plotted on a base map.

During our search for snail darter populations, new populations of the sharphead darter, Etheostoma acuticeps, and the spotfin chub, Hybopsis monacha, have been discovered. The sharphead darter, previously considered extinct, was located in apparently large numbers in the Nolichucky River (near Soloman Island). The spotfin chub, thought to be extinct in North Carolina, was discovered in the upper Little Tennessee River above Fontana Reservoir in North Carolina. Charles Saylor is presently working on a manuscript describing the sharphead darter discovery, and Richard Eager is doing the same with the spotfin chub.

A.

SELECTION OF TRANSPLANT SITE

Decision to Transplant

When TVA decided that transplantation of the snail darter to other rivers was a reasonable course of action to conserve and afford opportunities for the perpetuation of the snail darter, it became necessary to screen candidate sites with respect to their biotic and abiotic characteristics based on those observed in the Little Tennessee River. While there was some question at that time regarding taxonomic status of the fish, closure of Tellico Dam was scheduled for January 1977 and we felt an immediate transplant was desirable prior to a detailed examination of the candidate sites. This was based on our opinion that a lengthy period of acclimatization for the transplanted population would enhance the chances of a natural spawn in the early spring. Additionally, it would allow a full year of study on the population in the new habitat to be conducted concurrently with one on the natural population.

Previous investigations on the Little Tennessee and Hiwassee Rivers related to management of trout fisheries enabled us to identify the Hiwassee as a prime candidate for the transplants. After preliminary examination, the area from HRM 36.5 to HRM 38 was selected to receive the first transplants. The information used as an initial basis for selecting this location is presented here. Work is continuing on a detailed documentation of the conditions and characteristics of the Hiwassee and Little Tennessee Rivers.

Selection of Hiwassee River

The watersheds of the Hiwassee and Little Tennessee Rivers lie adjacent to each other and drain parts of Georgia, North Carolina, and Tennessee. Both

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have their headwaters in the Blue Ridge Physiographic Province which is in turn part of the Appalachian Mountains. This region is characterized by relatively high altitudes and steep slopes. The upper slopes and crests of the ridges are generally covered by a thin layer of soil and weathered rock while the underlying rocks are essentially siliceous and not easily dissolved. The steep slopes give rise to rapid surface drainage, and ground waters follow joints and fracture planes. Under these circumstances, the water from this area is characteristically low in dissolved minerals. This situation persists until waters from the lower slopes and outwash plains are contributed which have accumulated dissolved minerals from the coarse, loose soils. However, levels still remain low.

From extant data on mineral quality, the similarities of the two rivers are apparent (Table 2). Data shown are from stations sampled within the natural range of the snail darter on the Little Tennessee River and from 4.6 miles above the transplant area on the Hiwassee (TVA, 1972 and unpublished data). Although analyses variations among and within rivers are seen, we felt that all were biologically insignificant and would have no impact on any aspect of the snail darter ecology.

Temperature regimes within the rivers were examined for the period from July 1960 through March 1963 since this was the only information available that was both concurrent and consecutive for both rivers (TVA, 1966). Examination of the graph (Figure 3) shows monthly variations within rivers are very similar in configuration while monthly differences between the rivers never exceed 5 degrees Farenheit. Again, we did not consider these differences to be biologically critical.

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TABLE 2. Mineral quality of the Hiwassee and Little Tennessee Rivers.

Component	Hiwassee River Mile 42.6 Analysis in mg/l 1945-1946 Min.	1945-1946 Max.	1945-1946 Mean	1953-1964 Min.	1953-1964 Max.	1953-1964 Mean	1974 Min.	1974 Max.	1974 Mean
SiO_2	5.0	10.0	7.5	4.5	5.7	5.2	5.8	8.8	6.8
Ca	2.0	3.4	2.6	2.0	2.7	2.6	1.0	3.0	2.4
Mg	0.7	1.3	0.9	0.6	1.4	1.1	0.6	1.0	0.9
Na+K	0.9	7.8	3.0	2.0	2.7	2.4	1.3	2.3	1.9
HCO_3	7.0	10.0	8.2	10.0	14.0	12.3	-	-	-
SO_4	1.8	12.0	3.8	1.8	5.0	3.4	1.0	3.0	2.0
Cl	1.0	3.0	1.8	0.5	1.5	1.2	1.0	2.0	1.8
NO_3	0.0	20.0	2.6	0.0	0.4	0.06	-	-	-
Dissolved solids	19.0	51.0	26.0	13.0	30.0	21.5	10.0	30.0	21.0
Total hardness	9.0	13.0	10.6	9.0	13.0	11.3	5.0	12.0	10.0
pH (SU)	6.8	8.1	7.2	6.6	7.1	6.8	6.1	6.7	6.4

Component	Little Tennessee River Analysis in mg/l 1945-1946 (LTRM 5.7) Min.	1945-1946 (LTRM 5.7) Max.	1945-1946 (LTRM 5.7) Mean	1959-1960 (LTRM 13.9) Min.	1959-1960 (LTRM 13.9) Max.	1959-1960 (LTRM 13.9) Mean
SiO_2	5.0	9.0	7.0	6.0	9.0	7.2
Ca	3.8	9.8	5.5	3.0	4.4	3.9
Mg	1.0	2.4	1.7	0.7	1.5	1.0
Na+K	0.5	4.6	2.2	1.2	3.2	2.2
NCO_3	11.0	31.0	18.8	12.0	16.0	13.5
SO_4	1.3	5.4	3.4	2.6	4.5	3.4
Cl	1.0	3.0	1.6	1.0	2.0	1.2
NO_3	0.0	5.0	0.8	0.0	0.9	0.2
Dissolved solids	26.0	49.0	36.3	19.0	60.0	31.8
Total hardness	14.0	32.0*	20.9	13.0	15.0	14.2
pH (SU)	6.9	7.5	7.2	6.8	7.3	7.2

*Typographical error in reference lists as 321.

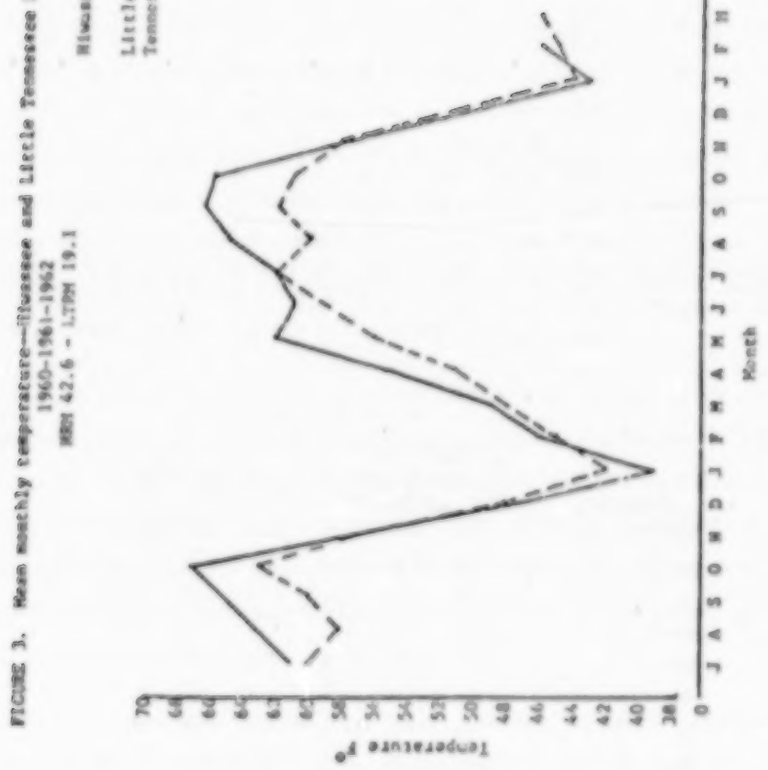

FIGURE 3. Mean monthly temperature—Hiwassee and Little Tennessee Rivers 1960-1961-1962 MRM 42.6 - LTRM 19.1

The initial comparison of substrate types within the two rivers was subjective, and in the opinions of several TVA biologists and technicians there was no dramatic difference. We have noted that macrophyte coverage in the Hiwassee is more extensive than that in the Little Tennessee during the summer months. This could make feeding more difficult for the snail darter; however, we have observed them foraging in macrophytes in areas of the Little Tennessee when open substrate was available. Quantitative analyses of substrates are being conducted at the present time.

Current velocities were estimated using drifting objects initially. Rates for both rivers appeared to be in the one to five feet per second range in the natural habitat and transplant areas. Depths are also comparable varying from one to three feet over the shoals and four to six feet in the slower pools.

With respect to benthos production, samples taken in previous years allowed us to characterize both rivers as moderately productive with fairly diverse communities. Dipterans of the families Simulidae and Chironomidae and caddisflies representing Hydropsyche and Brachycentrus were found to be abundant in both rivers but assumed less importance in the Hiwassee due to the more frequent occurrence of various genera of mayflies and stoneflies. Species composition and abundance of snails were virtually the same in both rivers, including Anculosa, which apparently constitutes the bulk of the snail darter diet (Starnes, 1975).

Fish species sympatric with the snail darter in the Little Tennessee are dominated by three types in the shoal areas. These include Percina caprodes, Percina evides, and Cottus carolinae. These same three species were found

to be dominant in the shoal areas of the Hiwassee although, overall, the community for all habitat types was more diverse. Potential predators in the Hiwassee are primarily trout which are stocked periodically by the Tennessee Wildlife Resources Agency. Few trout are seen in the Little Tennessee River snail darter habitat, but the area experiences periodic migrations of sauger, white bass, and walleye.

Consideration of the information above led us to believe an immediate transplant to the Hiwassee would have a reasonable opportunity for success, and we proceeded accordingly.

TRANSPLANTATION

After the Hiwassee River was selected as the transplant area, three sites on the river most resembling the habitat at Coytee Spring were chosen to receive the transplants. During the first phase of the transplant program, fish were collected by skin divers using slurp guns. After several tries using this method, with limited success, a 20-foot seine was utilized. The seine was held stationary in the river while a group of "kickers" moved toward it disturbing the substrate and chasing the darters into the seine.

Following collection of the snail darters, the fish were placed in an aerated bucket and then transferred to a large insulated ice cooler filled with water from the river after collection procedures were completed. Upon arrival at the transplant site, water from the Hiwassee River was slowly mixed with the water in the cooler to prevent any possibility of temperature shock during release. The darters were then released by hand, a few at a time, in front of divers who observed their reactions.

The initial reaction of most of the fish was to immediately swim to the bottom and remain motionless for a long period of time. The fish seemed somewhat disoriented after release and did not exhibit the same degree of alertness observed in their Little Tennessee River habitat. However, no fish were lost during transplant proceedings, and none appeared distressed when released.

A total of 581 snail darters (through February 14, 1976) have been transplanted from the Coytee Spring area and from River Mile 0.5 (five specimens)

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of the Little Tennessee River to the three transplant sites on the Hiwassee River (Table 3). Sex ratio of the fish transplanted in 1975 was virtually 1:1; however, thus far in 1976 three males have been moved for every female. An effort will be made in succeeding operations to increase the female percentage. An additional 61 snail darters were planted in the Nolichucky River (River Mile 18); however, operations were discontinued there due to the discovery of another rare fish, the sharphead darter (Etheostoma acuticeps).

Transplant Evaluation

Since the October transplant operations ended, the transplant sites on the Hiwassee River have been surveyed to monitor the snail darter populations. In January and February 1976, prior to the second transplant, relative abundance of the snail darter was estimated at all three transplant sites (Table 4) by the same method as used in the Little Tennessee River. Snail darter abundance at Transplant Site III (Table 4) (0.4 per transect) most nearly approached levels seen at Coytee Spring (1.1 per transect). Seasonal abundance estimates will be made throughout 1976.

Snail darters have been collected by seine from all three of the transplant sites on the Hiwassee River for observations on general condition and to determine superficially if gonadal development stage is comparable to that of snail darters in the Little Tennessee River. All of those collected have been in excellent condition, and gonad development closely parallels that of darters in the Little Tennessee River. Male snail darters have been free flowing since mid-November, tuberculated on the anal fin since early December, and tuberculated on the head region and caudal fin since

TABLE 3. Snail darter transplants through February 14, 1976

Date	Number
Transplant Site I: Hiwassee - River Mile 38	
06-03-75	11
06-05-75	15
06-06-75	23
09-28-75	5
09-16-75	33
09-17-75	61
	148
Transplant Site II: Hiwassee - River Mile 36.7	
09-18-75	24
09-30-75	55
02-09-76	24
02-10-76	27
	132
Transplant Site III: Hiwassee - River Mile 35.8	
10-01-75	75
10-02-75	28
10-08-75	42
10-14-75	36
02-06-76	67
02-09-76	53
	301
Hiwassee Total	581
Nolichucky - River Mile 18	
10-07-75	61
GRAND TOTAL FOR HIWASSEE AND NOLICHUCKY	642

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TABLE 4. Hiwassee River population analysis for January 1976. (mean number per transect)

Location	Left Bank	Midstream	Right Bank	All Locations
Transplant Site I	0.2	0.0	0.4	0.2
Transplant Site II	0.0	-	0.6	0.2
Transplant Site III	0.8	0.2	0.2	0.4

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late January. Female snail darters become free flowing in February. The overall ratio of females to male snail darters was 1.11 females to every male in the Hiwassee prior to the last transplant operations. Thus far during the present transplant (through February 14) the ratio has been 0.3 female to male.

The transplanted population appears to utilize the more abundant aquatic vegetation for cover. After first being alarmed, some of the snail darters "dive" into the vegetation and then slowly edge out until they are again on clean gravel substrate. Thus far, the darters do not appear to have moved appreciably from the original transplant sites. Feeding behavior has not been observed; but in many specimens, snails have been seen protruding from the anus suggesting this type of organism remains a significant item in their diet.

CBN:RBF:PLH
2/20/76

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LITERATURE CITED

Gale, William F. and J. Douglas Thompson. 1975. A suction sampler for quantitatively sampling benthos on rocky substrates in rivers. Trans. Amer. Fish. Soc. 104(2):398-405.

Starnes, Wayne C. 1975. Report on: Ecological study of the snail darter in the Little Tennessee River. Progress report for TVA grant TV-40564A. 19 pp.

TVA. 1972. Mineral quality of surface waters in the Tennessee River Basin. TVA Division of Water Control Planning, Hydraulic Data Branch, 230 pp.

___. 1966. Water temperature of streams and reservoirs in the Tennessee River Basin. TVA Division of Water Control Planning, Hydraulic Data Branch. 417 pp.

[EXHIBIT 76].

Charles J. Chance, Chief, Fisheries and Waterfowl Resources Branch

Richard B. Fitz, Biologist, Fisheries Resources Management

April 1, 1975

INTERAGENCY MEETING AND TOUR RELATIVE TO THE ALLEGED ADVERSE IMPACT OF TELLICO PROJECT TIMBER SALE ON THE SO-CALLED SNAIL DARTER, MARCH 24, 1975

As a result of a January 20, 1975, petition to the Department of the Interior to stop the commercial timber cutting on the Tellico Project, which the petitioners felt was endangering the so-called snail darter, TVA invited representatives of the Office of Endangered Species, U. S. Fish and Wildlife Service, to come to Norris and discuss the matter with TFWMD personnel and tour the area in question. Dr. James Williams represented the OES and was accompanied by Cary Henry, a regional biologist for the U. S. Fish and Wildlife Service out of Atlanta.

After a morning meeting which included discussions of the taxonomic status of the darter, the intent of the Endangered Species Act of 1973, and the effect of the timber cutting, a helicopter tour was made over the project to observe the timber cutting areas and sources of turbidity.

After passing over the damsite, we proceeded up the river at a low enough altitude to be able to see the slash and stumps left by the loggers. It was obvious that timber cutting in the reservoir basin had not been extensive. A stop was made on the right bank at LTRI 6 to examine closely the cut made along the creek near Davis Ferry Road. A previous inspection had revealed this to be an area of concentrated logging. The creek was high and very turbid as it flowed through the logged area, but further inspection showed that the turbidity was present even before the streams entered the logged area.

A second stop was made on the right bank at LTRI 7 (Coytee Spring) where the so-called snail darter was first discovered. Since the entire cross section of the river was turbid, the substrate associated with the fish could not be examined.

From Coytee Spring, we continued up the river at an altitude and speed sufficient to allow observation of highly turbid streams (these drain agricultural areas and have no timber cutting on them) entering the Little Tennessee. Particularly noteworthy were Hinsmile and Toqua Creeks and the Tellico River. The main river did not become clear until we passed the mouths of Fourmile and Citico Creeks.

Exhibit Report
Re copy should be sent to LAW!

Civil 3-76-73 GOVT. PLTF. EXHIBIT 76

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Charles J. Cuanco
April 1, 1975

INTERAGENCY MEETING AND TOUR RELATIVE TO THE ALLEGED ADVERSE IMPACT OF TELLICO PROJECT TIMBER SALE ON THE SO-CALLED SNAIL DARTER, MARCH 24, 1975

After flying over Chilhowee Dam, we proceeded directly to Tellico Plains in order to locate the source of turbidity in the Tellico River. It was apparent that the large fields at the edge of town are prime contributors. However, a few miles downstream the volume of mud and silt emanating from the mouth of Sink Hole Cove probably contributed 50 percent of the total load carried by the river.

Finally after leaving the Tellico River, we made one more pass over the logged areas and flew back to Norris.

After the tour, Dr. Williams requested information showing the areas that have been cut and those that will be cut. He also expressed concern that the future cuts would be more concentrated than those he observed. I was able to assure him in a telephone conversation the next day that we had no reason to believe future cutimber operations would be any more intensive. This information was given to us by Tom Boyd, DEF, Athens. During the conversation Dr. Williams stated that, based on the tour and discussions with us, he could see no real impact of the logging operations on the so-called snail darter. He also indicated that this would be verified by further communication in the near future.

827:535

[EXHIBIT 78]

[Memo]

Ben D. Jaco, Fisheries Projects Manager, Fisheries Resources Management Section

Richard B. Fitz, Biologist, Fisheries Resources Management Section

July 9, 1975

Federal Agency meeting on the Endangered Species Act of 1973, May 29, 1975, Washington, D.C.

Since the enactment of Public Law 93–205, there has apparently been some uncertainty among many Federal agencies as to the interpretation of the Act. Of primary concern is Section 7 which deals specifically with the overall roles and responsibilities of all Federal Agencies.

In light of the confusion emerging, the Departments of Interior and Commerce extended invitations to all Federal Agencies to attend a meeting at which a general overview of the Act would be presented with special emphasis on Section 7. Dr. Ripley and I attended as representatives of TVA.

Introductory remarks by Lynn A. Greenwalt (Director, U.S. Fish and Wildlife Service) and Robert W. Schoening (Director, National Marine Fisheries Service) were not particularly enlightening. However, it was interesting to hear Mr. Greenwalt admit that the U.S. Fish and Wildlife Service is not absolutely certain how some sections of the Act are to be interpreted.

The opening address was provided by Nathaniel Reed, Assistant Secretary of the Interior for Fish and Wildlife and Parks. After presenting a general history of the Act, he touched on a few specific points such as cooperation with states and private citizens, possession of specimens, and the importance of identifying "critical habitat." His statement that no agency was expected to identify all organisms in a project area, although realistic, came as somewhat of a surprise to me, considering my preconceived evaluation of Mr. Reed. Finally, he emphasized that agencies should carefuly consider all future benefits, no matter how obscure, that may come from organisms to be impacted by a project.

Keith M. Schreiner, Associate Director, Federal Assistance, U.S. Fish and Wildlife Service, under whom the Office of Endangered Species falls, reviewed the meaning of each section in the Act individually. Most of his dissertation dealt with information that can easily be understood, in my opinion, by reading the Act. A few points, however, are worth noting. He placed special emphasis on the definition of "conservation" appearing in Section 3 as meaning *all* fish and wildlife management actions. There are 109 animals on the present endangered list, of which 49 may be declared threatened or be delisted. His explanation of the listing process cleared up a few of the gray areas as to the listing status of the "snail darter." Generally, Dr. Ripley and I were favorably impressed with Mr. Schreiner's practical and real-world view of the Act and its constraints.

Dr. Ripley felt it would be to our advantage to raise two questions publicly regarding the Tellico Project-"snail darter" controversy. The first question, "Is TVA required at this time to have a permit to transplant the 'snail darter' to another river system?" was asked in order to make known our intentions to establish a new population of the fish. The second, "Is the Act retroactive to include projects started before enactment?" pointed out the absence of any reference to this in the Act and perhaps gave indication that this would be challenged if necessary. These questions were asked in the meeting after Dr. Ripley discussed them privately with Mr. Schreiner over lunch. As a matter of academic interest, the answers to the questions were, "No permit is required as long as it is not on the endangered list," and "It is a violation of the Act to jeopardize an endangered species." No comments on either of the questions or answers were made by other agencies.

We also discussed privately our intention to transplant the fish and inquired whether this action was compatible with the intent of the Act, contrary to what we had been told previously by a member of the ORS staff. Mr. Schreiner felt it was definitely within the intent and encouraged us to do so.

Dr. Ronald O. Skoog, Chief, Office of Endangered Species and International Activities, U.S. Fish and Wildlife Service, interpreted Section 7 which deals specifically with the responsibility of all Federal Agencies in complying with the Act.

He emphasized that consultation with the Secretary of the Interior regarding endangered species should come quite a bit prior to preparation of any Environmental Impact Statement. of "critical habitat" identification and protection was presented as the main vehicle through which an endangered species would be preserved.

The discussion period at the end of the meeting revealed that a few agencies were still either unable to recognize their responsibilities under the Act or were unwilling to initiate anything regarding environmental protection on their own. As a result, an ad hoc committee will be formed to draw up guidelines for these agencies to follow.

[EXHIBIT 81]

AUGUST 20, 1975.

DR. RONALD O. SKOOG,
Chief, Office of Endangered Species, U.S. Fish and Wildlife Service, Department of Interior, Washington, D.C.

DEAR DR. SKOOG: You may have already seen a copy of our "Program to Conserve Snail Darter," which was sent to the Director of your Service the other day in commenting on the proposal to list the "snail darter" as an endangered species. We believe this is a sound program and one that offers high potential for the successful introduction of this darter into other large river habitats, where it apparently does not now occur. We would appreciate having your detailed, recommended comments on this work and will be glad to discuss the program with you at your convenience.

Sincerely yours,

THOMAS H. RIPLEY,
Director, Division of Forestry, Fisheries and Wildlife Development.

Enclosure.

BC: Robert Jones, Jones & Stokes Associates; Dr. Edward C. Raney, Ichthyological Associates; *Lynn Seeber, 411 NSB–K*; Lewis E. Wallace, 635 NSB–K.

[EXHIBIT 83]

C. J. Chance, Chief, Fisheries and Waterfowl Resources Branch

R. B. Fitz, Biologist, Fisheries Resources Management Section

October 22, 1975

USFWS-TVA MEETING ON THE SNAIL DARTER, OCTOBER 14, 1975

The listing of the snail darter as an endangered species by the USFWS is certain to affect TVA's program to conserve the fish. In order to assess this impact, a meeting was arranged with personnel from the Office of Endangered Species in Washington, D.C. Lew Wallace, Tom Ripley, and I represented TVA while OES was represented by Keith Schreiner, Associate Director of Federal Assistance, Dr. James Williams, Biologist for OES, three members of the USFWS legal staff, and a member of the USFWS director's staff.

When we brought up the subject of our conservation program and expressed our concern that no comment had been received as to its adequacy, other than what had appeared in the notification of listing, Mr. Schreiner stated that he had not seen the program outline and was unaware of its existence. Dr. Williams acknowledged that it had been received as part of TVA's comments on the then proposed listing and that copies had been sent to several unnamed ichthyologists for review. Specifically referring to the transplant activity, he said the main concerns were (1) the identification of any biotic and abiotic factors in the Hiwassee River which have kept the snail darter from occurring there naturally; (2) transplantation of snail darters with a sex ratio suitable for reproduction; and (3) the best time of the year to transplant. In response we assured them that a detailed examination beyond our preliminary evaluation was being conducted on both the Hiwassee and the Little Tennessee Rivers. We agreed that a transplant just prior to and during the spawning season was desirable, and we had planned to do that but felt it was also important to introduce a number of fish several months in advance in case a period of acclimatization was needed and to avoid contributing to the normal stress of the reproductive season. No opportunity arose to address the question of sex ratio.

There was some discussion as to the applicability of the Act to existing projects, such as Tellico, with OES conceding that they were unsure of its interpretation in that respect. A number of related questions concerning the history of the Tellico Project were asked by the OES legal staff. Wallace provided those answers and also focused attention on the fact that the possible existence of undescribed species of fish was duly noted in the course of environmental review and litigation

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relating to the project, which continued to be approved through appropriations from Congress. There was no significant response to this other than some conjecture that perhaps the undescribed species mentioned in the testimony referred to the "duskytail darter, Etheostoma (Catonotus) sp. . ."

The question of reservoir clearing and its alleged impact on the snail darter received considerable attention. Mr. Kirby explained in detail the methods we intended to use. He emphasized that since we felt the problems from siltation were insignificant under normal procedures, the net benefit of the procedures in effect at Tellico would be an improvement in aesthetics. Dr. Williams repeatedly asserted that we could not be sure there would be no effect; and if we were going to make a mistake, we should take it in favor of the fish rather than in favor of our clearing specifications. He also expressed the hope that we could move the clearing operations to remote areas of the basin, but Wallace gave him no encouragement especially since our experts are of the opinion that the impact is negligible. At this point, we suggested that he inspect the area himself and draw his own conclusions.

The rediscovery of the sharphead darter in the Hiwassee River was related to OES to provide them with additional information on a species being considered for listing and as evidence that although we cannot categorically say the snail darter exists elsewhere in the Valley neither can OES say it does not. Dr. Williams was quite interested in this information, and I got the impression he did not miss the second point either. We informed them that with the discovery we had decided to suspend any further transplants to that river to avoid possible competition between the two species.

Mr. Schreiner confirmed that as of November 10 we would need a permit to conduct further research and transplant activities as they relate to the broad meaning of Sections 7 and 9. Also with the listing we become obligated to consult with the USF&S regarding the program and will probably be required to do this through the regional office in Atlanta. We said it would take a minimum of 60 days for issuance and probably much longer depending upon the thoroughness of our application. It was suggested that along with our application we request permission to continue the progress until receipt of the permit. We were also informed that by the end of next week (October 24) the necessary paper work will be completed to designate river miles 0.5 through 17 on the Little Tennessee as "critical habitat" for the snail darter. We got the distinct impression that OES is in favor of the transplant, if unofficially, and are hopeful of its success.

TVA's immediate responsibilities include applying for a permit to conduct the program accompanied by a request to be allowed to continue our investigations and transplants while the application is being processed. Additionally, we are committed to furnish OES the more detailed version of the program workplan for their review. Our legal staff will advise us as to when and how the above materials will be transmitted. At our request, Dr. Williams agreed to send us copies of all comments they received pertaining to the listing and comments regarding the program outline TVA previously submitted.

RBF:FLH

[EXHIBIT 86]

December 1, 1975

Dr. James D. Williams
U.S. Department of the Interior
Fish and Wildlife Service
Office of Endangered Species
Washington, D.C. 20240

Dear Jim:

This is in response to our telephone conversation of November 24, 1975, regarding the Tellico Basin clearing.

As you may recall, there will be approximately 2,000 acres cleared by the time we have completed the operation. This amounts to 0.5 percent of the total 408,400-acre watershed below Chilhowee Dam to Little Tennessee River Mile 5, much of which, as you observed from the helicopter during your March 24, 1975, visit is agricultural land. This land has been subjected to extensive clearing, plowing, and cultivating for many years and has produced a correspondingly heavy silt load in the watercourses.

Sedimentation experts with the Tennessee Valley Authority's Division of Water Management have examined past records of sediment transported by the Little Tennessee River and have estimated the soil loss which could be produced by reservoir clearing. Prior to construction of any dams on the Little Tennessee River, average sediment loads were probably around 800,000 tons per year. Early Tennessee Valley Authority sediment measurements show that average annual sediment loads in the late 1930's averaged around 340,000 tons. Since the Fontana and Chilhowee impoundments, the average load declined to approximately 234,000 tons per year. Sediment production which could be attributable to the Tellico Reservoir clearing is estimated to be less than 1 percent of the sediment load.

We have also studied the clearing operations for possible effect on the darter and have concluded that there will be no significant impact on the darters or their normal life history functions resulting from the basin clearing. We have reviewed the basin clearing specifications by foresters and feel they are environmentally sound. Out of an abundance of caution,

two changes in the clearing plans have been made to even further reduce any potential soil loss. One was with respect to additional precautions regarding log skidding, and the other change was to lower the clearing elevation by two feet.

The cleared area adjacent to Coytee Spring has been fertilized and planted with grasses and is now covered with a healthy growth. As I mentioned in our phone conversation, I have assigned a staff forester, having a watershed management background, to work with the clearing supervisors making onsite inspections and suggesting modifications in procedure when necessary.

Sincerely,

Thomas H. Ripley, Director
Division of Forestry, Fisheries,
and Wildlife Development

NDV:THR:JSB
CC: Mr. Kenneth Black
Regional Director
Bureau of Sport Fisheries and Wildlife
U.S. Fish and Wildlife Service
17 Executive Park Drive, NE.
Atlanta, Georgia 30329

M. L. Foster, 511 AB-K
G. H. Kimmons, 607 UB-K
P. A. Kronkel, 368 401B-C
E. H. Lessens, 449 EB-K
H. S. Sanger, Jr., 629 NSB-K
J. P. Taylor, 109 WCB-K

[EXHIBIT 88]

3-26-48
#88

January 22, 1976

Mr. Kenneth Black, Regional Director
United States Fish and Wildlife Service
17 Executive Park Drive, NE
Atlanta, Georgia 30329

Dear Ken:

This is in response to Mr. Greenwalt's October 29, 1975, letter requesting background information on the Tellico Project and TVA's efforts to conserve the snail darter, and is in furtherance of our interagency cooperation and consultation. As you will recall, on December 24, 1975, I forwarded to you a copy of TVA's "Program to Conserve the Snail Darter, Percina (Imostoma) sp. nov." along with a copy of our application for a section 10 permit to continue our studies and conservation efforts. In addition to that material, we are providing two copies of the Tellico Project final environmental impact statement (Attachment A), the Timberlake New Community Development draft environmental impact statement (Attachment B), and the Tellico Reservoir Construction Specification for Reservoir and Drainage, No. TC-858 (Attachment C). Also included are a Summary Statement entitled "Tellico Project and the Proposed Timberlake New Community" (Attachment D) and various maps (Attachments E to G) which may be helpful in understanding the Project and the circumstances surrounding our conservation efforts prior to the November 10, 1975, listing of the snail darter. A discussion of the Project background, status, and construction operations and schedules follows.

Project Background

A. Description

The Tellico Project is a multipurpose project which will create a 16,300-acre reservoir (at normal maximum pool elevation) in portions of Blount, Loudon, and Monroe Counties, Tennessee (see Attachment E). The dam will impound 33 miles of the Little Tennessee River from its mouth to Chilhowee Dam. Average water level fluctuation will be 6 feet with a normal maximum pool elevation of 813 feet above mean sea

level. The reservoir area is 20 miles southwest of the Knoxville metropolitan area and is readily accessible to major highway, rail and air transportation services.

Significant long-term social and economic opportunities will be created by the Project in an east Tennessee area characterized by low incomes and underutilization of human and natural resources. The Project will also provide: 126,000 acre-feet of flood control storage to help protect downstream communities, such as Chattanooga, Tennessee, from the ravages of floods; a 9-foot-deep navigation channel providing opportunities for commercial and industrial development needed to create decent paying jobs for residents of the area; an average of 200 million kilowatt hours of electric energy per year by diversion of the reservoir flow through a connecting canal to the generating turbines at the Fort Loudoun Dam; and other benefits which will accrue from water supply availability, fish and wildlife management, shoreline and recreation development.

As indicated, one of the purposes of the Tellico Project is to realize the potentials for providing social and economic opportunities. TVA's forecasts and those of two private consulting firms estimate that as a part of shoreland development, 4,000 to 6,000 industrial jobs could develop over a 20-year development period. TVA, the State of Tennessee, and county and local governments and planning organizations have been working together to provide for orderly planning and development of this anticipated growth.

To that end, the State of Tennessee has enacted model legislation, known as The New Community Development Act of 1974 (34 Tenn. Code Ann. §§ 13-1501 to 1517), to provide for the orderly growth and development of new communities. TVA has issued a draft environmental statement for the Timberlake proposal, a planned new community that would be created as a part of the shoreline development (Attachment B).

The Timberlake Project is being planned and implemented through the broad-based planning involvement of many elements of local government. These include the Timberlake Advisory Board, comprised of planners from TVA, HUD, Tennessee State Planning Office, State Office of Urban Affairs, The University of Tennessee, and East Tennessee Development District, and the Tellico Area Planning Council which is made up of officials of Blount, Loudon, and Monroe Counties, Monroe County Industrial Development Commission, and Knoxville Area Urban League.

B. Congressional Approval and Funding

Congress first made funds available in 1942 for beginning construction of the Tellico Project, then known as the Fort Loudoun extension; however, the resource commitment priorities for the World War II effort prohibited the start of construction. Congress again appropriated funds for start of the Project in fiscal year 1967 and, with the exception of carry-over funding in fiscal year 1974, has continued to appropriate money each year for Tellico, despite litigation over the environmental aspects of the Project, including the effects on rare and endangered species of fish (Environmental Defense Fund v. TVA (Tellico I), 339 F. Supp. 806 (E.D. Tenn.), aff'd, 459 F.2d 1164 (6th Cir. 1972); Environmental Defense Fund v. TVA (Tellico II) 371 F. Supp. 1004 (E.D. Tenn. 1973), aff'd, 492 F.2d 466 (6th Cir. 1974)). Congress has appropriated an additional $29,142,000 for continued construction of the Project through September 30, 1975. As stated in the House Report which accompanied the fiscal 1976 appropriation bill (H.R. 8122) through both Houses, Congress has determined that the Project should be completed. The Report states:

> The bill provides the budget request of $23,742,000 for construction of the Tellico dam reservoir. The Committee directs the project, for which an environmental impact statement has been completed and provided the Committee, should be completed as promptly as possible for energy supply and flood protection in the public interest. House Rep. No. 94-319, 94th Cong. 1st Sess. 76 (June 30, 1975).

As of November 30, 1975, approximately $71 million of the total Project costs of $100 million has been obligated, with dam closure scheduled for January 1977.

Project Status and Schedule

As already indicated, initial planning and design for the Tellico Project began in the early 1940's with onsite construction commencing in March 1967. As of January 1, 1976, the Project is approximately 70 percent complete, with a scheduled completion date of January 1977. The status and cost of major reservoir construction-related activities are summarized in the following table:

TELLICO PROJECT
CONSTRUCTION STATUS AND FUNDS OBLIGATION
(THROUGH NOVEMBER 30, 1975)

Activity	Estimated Project Cost (Thousands of Dollars)	Funds Obligated (Thousands of Dollars)	Completion Date	Percentage Completed
Land Acquisition and Related Costs (including relocation assistance)	26,000	23,032	June 1976	95
Main Dam, Spillway, and Auxiliary Dams	17,400	13,309	January 1977	75
Reservoir Adjustments, Clearing, and Rim Treatment (including adjustments for roads, railroads, and utilities)	35,000	23,992	June 1977	65
Interreservoir Canal, Channel Improvements, Public-Use Facilities, and Other Structures	6,600	654	December 1977	5
Construction Plant, Equipment, and Inventories	-	240	-	-
Construction Supervision and Services, General Engineering and Design, and General Administration	13,000	9,176	December 1977	70
Total	100,000	70,903		

The fiscal 1976 Tellico budget includes $23,742,000 for continued work on the Tellico Project. An additional $5.4 million has been appropriated for the fiscal 1976 transition quarter. Planned application of these funds is set out in the following table:

TELLICO PROJECT
FISCAL 1976 AND TRANSITION
PERIOD BUDGET

Activity	F.Y. 1976	Transition Quarter
Substantial completion of land acquisition	$ 3,200,000	$ 50,000
Continuation of design and construction of highway and bridge relocations	12,300,000	1,800,000
Continuation of railroad bridge relocation	1,600,000	100,000
Continuation of reservoir utility relocations	1,000,000	300,000
Beginning of reservoir rim treatment and reservoir clearing	900,000	300,000
Continuation of main earth dam and spillway gate installation	2,000,000	800,000
Completion of auxiliary dams	200,000	—
Resumption of construction of interreservoir canal; continue other structures; complete channel improvements	1,700,000	1,800,000
Construction plant equipment and inventories	-100,000	-20,000
Construction supervision and services	1,057,000	314,003
General engineering and design	500,000	100,000
General administration	210,000	55,000
Changes in unpaid undelivered orders	-1,625,000	-199,000
Total	$23,742,000	$5,400,000

A. Land Acquisition and Adjustments

The Project requires the acquisition of 38,000 acres of land. At normal full pool elevation (813 feet above sea level) the reservoir will occupy 16,500 acres. The remaining shoreland will be primarily devoted to recreational, residential, and industrial development. As of January 1976, 1,930 acres of the total 38,000 acres are still

to be acquired by purchase or condemnation. Of the approximate 275 families within the Project area, 26 are still to be relocated. Activities related to recovery of archaeological resources are under way and will be completed by December 31, 1976.

B. Dam Construction and Interreservoir Canal

The main dam will be a combination concrete-gravity and earth-embankment structure. In addition, there will be three earthen saddle dams. The concrete portion of the main dam and spillway was completed in 1969. The earthfill portion of the main dam is approximately 2,700-feet long and will require 1.9 million cubic yards of fill when complete. The three earthen saddle dams are 2,150 feet, 470 feet, and 350 feet long, and will require 197,500 cubic yards of fill. Work on all earthen dams is presently under way and will be completed by late 1976. Excavation for the 1,000-foot interreservoir canal began in June 1974 and will be completed by January 1, 1977.

C. Reservoir Clearing

Reservoir clearing operations are being conducted in two phases. The first phase, commercial timber harvesting, began in December 1974. The portion north of the Highway 411 bridge was completed December 31, 1975, and the portion south of the bridge will be completed by April 30, 1976. The second phase involves the removal of all secondary vegetation, structures, and other potential obstructions to navigation at specified elevations within the area to be impounded (see Attachment C). Clearing is presently under way north of the Highway 411 bridge. Clearing south of the bridge is scheduled to commence in April 1976. The second phase will be completed by approximately December 1976.

These reservoir clearing activities have been carefully studied by TVA forestry, fishery, and sedimentation experts, who have concluded that they will neither result in significant silting of the Little Tennessee River, nor have any detrimental effect on the snail darter. Reservoir clearing involves approximately 2,000 acres out of a total of some 406,000 acres in the drainage area below Chilhowee Dam to just below the Coytee Spring area, in a total watershed area of over 1,600,000 acres. The area to be cleared is only a minute fraction of the acreage in the watershed which has been cleared and plowed for well over a century. Moreover, TVA has taken precautions to reduce the silt potential from the clearing by having a representative of the Division of Forestry, Fisheries, and Wildlife Development in the field with the clearing crews to make onsite suggestions for reducing the impact of the operation.

D. Road Relocations

Construction of the Project has necessitated the relocation of approximately 92 miles of highways and three miles of the L&N Railroad. Included in these totals are state and county highways and numerous segments of tertiary roads built to serve lands which would be left without access. Three major reservoir crossings, the L&N Railroad bridge, the U. S. 411 Highway bridge, and the Vonore-Tellico bridge, have already been constructed at a combined cost of over $10 million in order to allow a 35-foot vertical navigation clearance for craft expected on the new reservoir. A fourth major crossing, the inter-reservoir canal bridge (near the dam), is presently being constructed by the State of Tennessee under contract. It will have a 42-foot vertical navigation clearance over the normal summer pool (elevation 813).

Road relocations are being undertaken jointly by TVA, the State of Tennessee, and several area counties. Attachment F is a map showing the relative allocation of highway and railroad reconstruction projects among the governmental entities concerned. TVA has already spent or obligated over $21 million in highway and railroad relocation. The State itself is making an investment of approximately $13 million in project area road construction. Attachment G shows the construction status of the roads and railroad as of November 1975.

The reservoir crossings and much of the road relocation work would provide little community benefit in the absence of the Project.

E. Related Community Developments

With regard to Timberlake, a number of development plans and projects are already under way or being implemented. For example, the Tellico Area Services System (TASS) has under construction a $4 million water treatment system which incorporates capacity necessary to serve the early needs of Timberlake. TVA has already paid over $400,000 of its contractual share (Contract No. TV-37837A) for this facility. TVA, under a five-year contract with the Tennessee State Planning Office (Contract No. TV-36693A), is contributing funds to aid area planning efforts. Discussions are presently under way with Monroe County to cooperatively develop approximately 200 acres adjacent to a public port facility as an industrial area. The planned concept calls for the reservation of large waterfront sites for water-oriented industry and the development of industrial parks on the backland. TVA has already received several inquiries from corporations seeking 5- to 100-acre industrial sites, and one inquiry for as much as 1,000 acres.

In addition to providing needed jobs and incomes to area residents, the Tellico Project and related shoreland development will provide local governments opportunities for increased tax revenues necessary to expand and improve the level of governmental services. For additional information, see the enclosed Summary Statement entitled, "The Tellico Project and the Proposed Timberlake New Community" (Attachment D).

Snail Darter Conservation Program

In August 1973, Dr. David A. Etnier, Associate Professor of Zoology, The University of Tennessee, announced that he discovered and collected several specimens of a fish which he subsequently named the snail darter. These fish were taken from the Coytee Spring area of the Little Tennessee River (LTRM 6.8). The belief was expressed that the Little Tennessee River was a refuge for the last remaining relict population of the fish. On September 13, 1974, TVA entered into a contract with The University of Tennessee to fund a study of the life history and habitat of the fish and to investigate the possibility of transplanting the species into other rivers. The contract, as supplemented, extends the research funding through May 31, 1976.

On March 12, the U. S. Fish and Wildlife Service published a notice in the Federal Register that it had received sufficient information to warrant a review of the status of the snail darter (40 Fed. Reg. 11618). On October 9, 1975, the Fish and Wildlife Service published a rule in the Federal Register listing the snail darter as an endangered species effective November 10, 1975 (40 Fed. Reg. 47305-306).

Several months prior to the listing and as part of the Tellico Project, TVA initiated a study of the life history and habitat of the snail darter in the reach of the Little Tennessee River to be impounded. The stated objective is to conserve and afford opportunities for the perpetuation of the snail darter.

The program involves six major activities, the details of which may be found in the workplan, transmitted to you previously. Generally, these activities include the following aspects: life history and ecology, population estimates, habitat description, transplanting to new habitats, evaluation of transplant, and range and distribution.

Mr. Kenneth Black January 22, 1976

To achieve the program objective, TVA considers an attempt to establish the snail darter in other waters through transplantation to be the most reasonable course of action for conservation of the species. Life history and habitat studies are necessary to provide an understanding of the fish's maintenance requirements, which is used in evaluations of potential transplant sites. In addition, a thorough understanding of these factors facilitate confident assessment of transplanted populations. Estimates of the natural standing stock or its relative abundance are used to determine optimal stocking ratios in the transplant areas.

Plans for transplants include two phases: (1) an early stocking to allow the darter an extended period of adjustment in the new environment prior to spawning, and (2) later stocking at the onset of spawning when the impetus for reproduction is strong enough to override any transplantation stresses. The first phase has been completed with 410 specimens being moved to the Hiwassee during the summer and early fall of 1975. Initiation of the second phase is contingent upon receipt of a permit from the U.S. Fish and Wildlife Service.

We believe that our snail darter conservation program will be successful in establishing the darter in other habitats. Observations of transplanted populations reveal that these animals exhibit the same behavior patterns and sexual development as seen in the natural population.

I hope this letter and attachments, along with the conservation program workplan transmitted previously, will provide you with sufficient information to understand the Project and circumstances surrounding our snail darter conservation efforts. We are anxious to cooperate with you in every way possible and to exchange information which would be helpful with respect to this Project. We would be happy to meet with you to discuss this information or answer any questions you may have.

Sincerely,

Thomas H. Ripley, Director
Division of Forestry, Fisheries, and Wildlife Development

1/29/76--JSB
CC: H. S. Singer, Jr., 639 NSB-K

RJF:TWR:NC
Enclosures
CC: Mr. Harvey Bray, Director
Tennessee Wildlife Resources Agency
Post Office Box 40747
Nashville, Tennessee 37204

Mr. Keith N. Schreiner
Associate Director, Federal Assistance: Program Manager
U.S. Fish and Wildlife Service
Washington, D.C. 20240

1/26/76--JSB
CC: Mr. Lyna Seeber, 411 NSB, Knoxville

1/26/76--JSB
CC: Dr. Edward C. Raney, Ichthyological Associates

[EXHIBIT 93]

UNITED STATES GOVERNMENT

Memorandum

: Associate Director - Federal Assistance DATE: 2/2/76

: Acting Deputy Associate Director - Federal Assistance

JECT: Interim Authority for TVA to Take Snail Darters

This sums up the current situation with reference to the Decembe request from TVA for interim authority to take snail darters.

There have been many discussions between various individuals and groups and the situation is complicated and sensitive. During the week of January 26, I had discussions with you and Mr. O'Connor; Regional Director Black; TVA, Dr. Ripley; a group session with representatives of SOL, SE. LE, and this Office.

Very concisely and simplistically, this is the way it stacks up.

On January 26, a permit was issued (after due Federal Register review process) for a graduate student (Starns) to take 150 darters for various purposes, 50 of which may be killed for food habit studies. This work is being partially funded by TVA. This is part of a broader study on the darter and will yield needed biological data on food habits, potential habitat, etc. That number will not damage the population. The data will be useful to the RO, to TVA, and to SE on future work on this species. All can get input into the study though relationships have not been the best to the present time. Starns has access to 50 specimens he previously collected, and 12 in the collection of University of Tennessee. There are about 40 specimens elsewhere and not available for food habit dissection. No collections have been made on the January 26 permit. Consideration was given to a cancellation of this authority, but the concensus seems to be that it is a valid, needed, and legitimate activity and cancellation at this date would be disruptive to the entire study and not entirely warranted.

Recommendation: Allow the January 26 authority to stand, with understanding that the data obtained will obviate the need for TVA to make additional collections (killings) for food habit purposes. Dr. Ripley is in agreement.

The main purpose of the December 24 TVA interim request is to relocate 300 darters into three locations to assure their survival if the dam gates are closed, as scheduled on January 1977. TVA also requested authority to kill 300 -- 25 per month, for food habit studies. This

2

request would be denied in view of the Starns permit mentioned above.

There is a considerable biological question as to the success of such a transplant. (It is not likely it will ever be obtained. Evidence is lacking to fully support a transplant.) In fact, experience and empirical knowledge weighs against the success of limited transplants. On the other hand, the fish transplanted previously to three locations did survive and are now approaching breeding maturity. One year survival, however, is far from conclusive evidence of success.

So, it comes down to a matter of biological risk and judgment based on the data at hand. And, that judgment shou d be made now, before the fish spawn.

Conclusions. There is a biological risk in moving 300 endangered fish out of a population that may be less than 1500. They might all be doomed. However, transplant may be the only way to save the species if the gates close as planned. Early evidence indicates success of fish planted to date. The prudent move would be to authorize the transplant now and to remove and relocate most of the remaining population in December 1976 or January 1977, before the gate is closed, leaving a brood stock behind in the event they can survive the closure.

Recommendation. Issue the interim authority as requested immediately, including permission for the relocation of 300 darters and denying collection of 300 for food habit studies. This course has the advantage of making the effort to save the species under the provisions of section 10, with full recognition of the biological risks involved. It has the concurrence of Regional Director Black and TVA Dr. Ripley.

If you concur, the interim letter is attached for signature

Jack N. Berryman

Concur _____

Date 2/3

[EXHIBIT 97] ,

TO : Files, Division of Forestry, Fisheries, and Wildlife Development

FROM : C. J. Chance, Chief, Fisheries and Waterfowl Resources Branch
R. B. Fitz, Biologist, Fisheries Resources Management Section

DATE : February 19, 1976

SUBJECT: SNAIL DARTER CONSULTATION MEETING, FEBRUARY 14, 1976

Representatives of the Tennessee Wildlife Resources Agency, U.S. Fish and Wildlife Service, and TVA met in Nashville to discuss the snail darter conservation program as part of the consultation procedure under the Endangered Species Act. A list of attendees is attached.

The initial part of the meeting was spent reviewing the transplant activities from the beginning. This was followed by a detailed discussion of each point in the interim permit. Throughout the meeting there were many questions regarding aspects of the program beyond the transplantation.

Following the review of our present activities, the conference felt there were certain "amendments" required on our interim permit. A request for these changes was telegraphed to Keith Schreiner, February 17 1976 (copy attached).

Additional agreements, suggestions, and pertinent comments are enumerated below:

1. Dr. Williams verified that there are no strict guidelines for consultation but that they are being developed.

2. Mr. Henry told us that the meeting was designed to fulfill the consultation requirement.

3. Mr. Yambert said that under law it is the state's perogative to stock fish and thus he feels that TVRA should be actively involved in the planning of transplant activities.

4. TVRA considers TVA to be in violation of state law having transplanted more darters than are provided for in a letter of authority issued by Harvey Bray. They agreed, however, to draft a new letter to cover this. We were admonished to observe the state laws in the future.

EXHIBIT 97

252-661 O - 78 - 36

FF&WD Files
February 19, 1976

SNAIL DARTER CONSULTATION MEETING, FEBRUARY 14, 1976

5. There was a great deal of discussion about additional transplant sites if needed. The conference agreed that further searches should be considered within the Tennessee Valley. TVRA made it clear, however, that they would want to make their own evaluation prior to any transplantation.

6. TVA agreed to provide a progress report to TVRA and the USFWS every two weeks covering highlights with significant developments transmitted by phone or letter as they happen.

7. Mr. Henry told us that the Director of the Regional Office, USFWS, in Atlanta was completely responsible for the agency's snail darter activities and would only inform Washington, not recommend.

8. Dr. Etnier revealed that he played a primary role in determining the conditions of our interim permit.

9. The conference unanimously agreed that, in the event the transplant did not work and the natural population was extirpated, there would be no advantage to hold a reproducing captive population if indeed it is possible to raise them.

10. Dr. Williams wanted to know if TVA was going to submit comments on the critical habitat designation. We assured him they would be forthcoming.

11. TVA's application for a research permit was published in 41 FR 5647-5(February 9, 1976, and is subject to a 30-day comment period ending March 10, 1976. Dr. Williams was somewhat optimistic that it would be issued around March 13 or 14.

12. Etnier and Starnes estimate a total of 10,000 snail darter in the Little Tennessee River.

13. Specimens which are stripped of eggs or milt are not included in the 30 TVA is allowed to hold according to Mr. Henry.

In general, we were pleased with the conference as the atmosphere was very cordial, the topic was confined to our conservation program, and there was no discussion of the legality or morality of the Tellico Project

2/20/76--LW
Telecopied to: Law Wallace, Law (w/attachment)

RBF:PLH
Attachments

2/20/76--JSB
CC: Mr. Robert Jones, Jones & Stokes Associates, Inc. (w/attachment)
Dr. Edward C. Raney, Ichthyological Associates (w/attachment)

SNAIL DARTER CONSULTATION MEETING - 2/14/76

Name	Organization	Address
Gary Henry	USFWS	Atlanta, GA
Jack Chance	FF&WD-TVA	Knoxville, TN
Jim Stewart	USFWS	Norris, TN
Price Wilkins	TVRA	Morristown, TN
Gary Myers	TVRA	Nashville, TN
Gary Hickman	FF&WD-TVA	Norris, TN
Dick Fitz	FF&WD-TVA	Norris, TN
David A. Etnier	UT-Zoology	Knoxville, TN
Wayne P. Starnes	UT-Zoology	Knoxville, TN
J. S. Ramsey	USFWS	Auburn, AL
J. D. Williams	USFWS	Washington, D.C.
Bill Tambert	TVRA	Nashville, TN

2/20/76--LW
Telecopied to: Lewis Wallace, Division of Law

[EXHIBIT 107]

Norris, Tennessee 37828

April 13, 1976

CIVIL 3-76-48 GOVT. PLTF. EXHIBIT 107
Crim. ___ DEF.
[illegible]
Stanley R. Ford, Clerk U.S. District Court

Mr. Gary Henry
U.S. Fish and Wildlife Service
17 Executive Park Drive, NE.
Atlanta, Georgia 30329

Dear Mr. Henry:

This confirms your March 30, 1976, phone conversation with Richard Fitz concerning the procedure for consultation about the disposition of snail darter larvae reared in the Tennessee Valley Authority laboratory. It was generally agreed that consultation about this type of problem can best be handled by telephone or correspondence rather than by formal meeting. Since that time, we have received a letter from Harold Benson indicating that the larval fish should be held for approximately six to eight weeks in order to ensure better survival rates when transplanted to the wild. The question of the best procedure to utilize in reintroducing the fish to the wild has become moot, however, since none of the larval fish hatched have survived.

The following provides a brief summary report of our experience with our efforts to hatch and rear snail darters:

Our final accounting for the total 1,442 snail darter eggs taken for laboratory hatching and rearing is as follows: an estimated 1,110 did not become fertilized, 290 fertilized eggs died from unknown causes, another 42 were killed in the embryo stage and preserved to document developmental stages, and 130 larvae were hatched. Of the larvae fish that hatched, 32 were killed and preserved for study during the early development of the larvae, 11 were lost due to equipment problems, and 86 died from causes not determined as of this letter.

As you are aware, laboratory techniques for rearing many species of larval fish, including darters, are not well developed. In this regard, we understand that the larvae taken by Wayne Starnes for rearing likewise did not survive.

All eggs and larvae taken for laboratory rearing have been preserved and are being held at the Norris Fisheries Laboratory. These are available for your inspection at any time. If you have any questions about these data or our experience with

our efforts to hatch and rear these fish, please contact Richard Fitz or Gordon Hall at Norris. Further documentation will be presented in forthcoming progress reports.

Sincerely,

Thomas H. Ripley, Director
Division of Forestry, Fisheries,
and Wildlife Development

THR:WBP:JCETT
CC: Mr. Harold Benson, USFWS, Atlanta
Mr. Hallett D. Boles, USFWS, Norris
Mr. Harvey Bray, TVRA, Nashville
Mr. Harold Hurst, TVRA, Morristown
Mr. Willie Parker, USFWS, Nashville
Dr. Ronald O. Skoog, USFWS, Washington, D.C.
Mr. W. Reid Tatum, TVRA, Crossville
Dr. James D. Williams, USFWS, Washington, D.C.
Mr. D. William Yambert, TVRA, Nashville

4/13/76--JSB
CC: Mr. Robert Jones, Jones & Stokes Associates, Inc.
Dr. Edward C. Raney, Ichthyological Associates

C. J. Chance, Norris
F. B. Fields. Norris
R. B. Fitz, Norris
H. S. Sanger, Jr., 629 NSB-K

[EXHIBIT 109]

Civil B-K-76 GOVT. PLTF. EXHIBIT 109

FY&WD Files

Richard B. Fitz, Biologist, Fisheries Resources Management

April 1, 1976

CONVERSATION WITH GARY HENRY, USFWS, REGARDING SNAIL DARTER CONSULTATION

I had a telephone conversation with Gary Henry on March 30, 1976, primarily to discuss the upcoming consultation meeting scheduled for April 1, 1976. Henry felt that a formal consultation meeting was not necessary since the disposition of any snail darters we might rear in the laboratory was the only topic definitely on the agenda. He felt that this question and other individual problems could be handled by correspondence or telephone as part of our consultation requirements. Accordingly, we agreed to cancel the meeting and try to resolve the question by correspondence. He indicated to me that he would verify that these communications were part of the consultation procedures.

Mr. Henry mentioned that he had heard we found a snail darter four miles below the mouth of the Little Tennessee River. I verified this and also informed him that we had observed them 10 miles below the mouth. He seemed quite surprised and interested and said although the sitings just below the mouth and perhaps even that four miles downstream could be attributed to incidental drift, he doubted that the more distant sitings could be explained in that manner.

RBF:ELD

[EXHIBIT 113]

AMERICAN FISHERIES SOCIETY
Special Publication No. 6

A List of Common and Scientific Names of Fishes from the United States and Canada

(THIRD EDITION)

Civil B-K-76 GOVT. PLTF. EXHIBIT 113

BY

REEVE M. BAILEY, *Chairman*
JOHN E. FITCH, EARL S. HERALD, ERNEST A. LACHNER,
C. C. LINDSEY, C. RICHARD ROBINS, AND W. B. SCOTT
Committee on Names of Fishes

Washington, D. C. 1970

Described Species of Darters and Related Fishes

COMMON NAME	OCCURRENCE	SCIENTIFIC NAME
	Percidae—perches	
Crystal darter	F	*Ammocrypta asprella* (Jordan)
Naked sand darter	F	*Ammocrypta beani* Jordan
Western sand darter	F	*Ammocrypta clara* Jordan and Meek
*Eastern sand darter	F	*Ammocrypta pellucida* (Putnam)
Scaly sand darter	F	*Ammocrypta vivax* Hay

COMMON NAME	OCCURRENCE	SCIENTIFIC NAME
Sharphead darter	F	*Etheostoma acuticeps* Bailey
Mud darter	F	*Etheostoma asprigene* (Forbes)
Cumberland snubnose darter	F	*Etheostoma atripinne* (Jordan)
*Orangefin darter	F	*Etheostoma bellum* Zorach
*Greenside darter	F	*Etheostoma blennioides* Rafinesque
Blenny darter	F	*Etheostoma blennius* Gilbert and Swain
Rainbow darter	F	*Etheostoma caeruleum* Storer
Bluebreast darter	F	*Etheostoma camurum* (Cope)
Blunthose darter	F	*Etheostoma chlorosomum* (Hay)
Ashy darter	F	*Etheostoma cinereum* Storer
*Creole darter	F	*Etheostoma colletteri* Birdsong and Knapp
Carolina darter	F	*Etheostoma collis* (Hubbs and Cannon)
Coosa darter	F	*Etheostoma coosae* (Fowler)
Arkansas darter	F	*Etheostoma cragini* Gilbert
*Choctawhatchee darter	F	*Etheostoma davisoni* Hay
*Coldwater darter	F	*Etheostoma ditrema* Ramsey and Suttkus
Blackside snubnose darter	F	*Etheostoma duryi* Henshall
Brown darter	F	*Etheostoma edwini* (Hubbs and Cannon)
Arkansas saddled darter	F	*Etheostoma euzonum* (Hubbs and Black)
Iowa darter	F	*Etheostoma exile* (Girard)
Fantail darter	F	*Etheostoma flabellare* Rafinesque
Fountain darter	F	*Etheostoma fonticola* (Jordan and Gilbert)
Savannah darter	F	*Etheostoma fricksium* Hildebrand
*Swamp darter	F	*Etheostoma fusiforme* (Girard)
Slough darter	F	*Etheostoma gracile* (Girard)
Rio Grande darter	F	*Etheostoma grahami* (Girard)
Harlequin darter	F	*Etheostoma histrio* Jordan and Gilbert
*Christmas darter	F	*Etheostoma hopkinsi* (Fowler)
Turquoise darter	F	*Etheostoma inscriptum* (Jordan and Brayton)
Bluestude darter	F	*Etheostoma jessiae* (Jordan and Brayton)
Greenbreast darter	F	*Etheostoma jordani* Gilbert
Yoke darter	F	*Etheostoma juliae* Meek
Kanawha darter	F	*Etheostoma kanawhae* (Raney)
Stripetail darter	F	*Etheostoma kennicotti* (Putnam)
Greenthroat darter	F	*Etheostoma lepidum* (Baird and Girard)
Longfin darter	F	*Etheostoma longimanum* Jordan
Redband darter	F	*Etheostoma luteovinctum* Gilbert and Swain
Spotted darter	F	*Etheostoma maculatum* Kirtland
Pinewoods darter	F	*Etheostoma mariae* (Fowler)
*Smalleale darter	F	*Etheostoma microlepidum* Raney and Zorach
Least darter	F	*Etheostoma microperca* Jordan and Gilbert
*Yellowcheek darter	F	*Etheostoma moorei* Raney and Suttkus
Niangua darter	F	*Etheostoma nianguae* Gilbert and Meek
Johnny darter	F	*Etheostoma nigrum* Rafinesque
*Watercress darter	F	*Etheostoma nuchale* Howell and Caldwell
Barcheek darter	F	*Etheostoma obeyense* Kirsch
*Okaloosa darter	F	*Etheostoma okaloosae* (Fowler)

COMMON NAME	OCCURRENCE	SCIENTIFIC NAME
*Tessellated darter	F	*Etheostoma olmstedi* Storer
Finescale saddled darter	F	*Etheostoma osburni* (Hubbs and Trautman)
*Paleback darter	F	*Etheostoma pallididorsum* Distler and Metcalf
Goldstripe darter	F	*Etheostoma parvipinne* Gilbert and Swain
Waccamaw darter	F	*Etheostoma perlongum* (Hubbs and Raney)
Riverweed darter	F	*Etheostoma podostemone* Jordan and Jenkins
Cypress darter	F	*Etheostoma proeliare* (Hay)
Stippled darter	F	*Etheostoma punctulatum* (Agassiz)
Orangebelly darter	F	*Etheostoma radiosum* (Hubbs and Black)
*Bayou darter	F	*Etheostoma rubrum* Raney and Suttkus
Redline darter	F	*Etheostoma rufilineatum* (Cope)
Rock darter	F	*Etheostoma rupestre* Gilbert and Swain
Arrow darter	F	*Etheostoma sagitta* (Jordan and Swain)
Saluda darter	F	*Etheostoma saludae* (Hubbs and Cannon)
*Maryland darter	F	*Etheostoma sellare* (Radcliffe and Welsh)
Sawcheek darter	F	*Etheostoma serriferum* (Hubbs and Cannon)
Tennessee snubnose darter	F	*Etheostoma simoterum* (Cope)
Orangethroat darter	F	*Etheostoma spectabile* (Agassiz)
Spottail darter	F	*Etheostoma squamiceps* Jordan
Speckled darter	F	*Etheostoma stigmaeum* (Jordan)
Gulf darter	F	*Etheostoma swaini* (Jordan)
Swannanoa darter	F	*Etheostoma swannanoa* Jordan and Evermann
Missouri saddled darter	F	*Etheostoma tetrazonum* (Hubbs and Black)
Seagreen darter	F	*Etheostoma thalassinum* (Jordan and Brayton)
Tippecanoe darter	F	*Etheostoma tippecanoe* Jordan and Evermann
*Tuspot darter	F	*Etheostoma trisella* Bailey and Richards
Tuscumbia darter	F	*Etheostoma tuscumbia* Gilbert and Swain
Variegate darter	F	*Etheostoma variatum* Kirtland
Striped darter	F	*Etheostoma virgatum* (Jordan)
Glassy darter	F	*Etheostoma vitreum* (Cope)
Redfin darter	F	*Etheostoma whipplei* (Girard)
Banded darter	F	*Etheostoma zonale* (Cope)
Backwater darter	F	*Etheostoma zonifer* (Hubbs and Cannon)
Yellow perch	F	*Perca flavescens* (Mitchill)[1]
*Tangerine darter	F	*Percina aurantiaca* (Cope)
*Guideline darter	F	*Percina aurolineata* Suttkus and Ramsey
*Blotchside logperch	F	*Percina burtoni* Fowler
Logperch	F	*Percina caprodes* (Rafinesque)
Channel darter	F	*Percina copelandi* (Jordan)
Piedmont darter	F	*Percina crassa* (Jordan and Brayton)

[1] A. N. Svetovidov and E. A. Dmoferva, 1963, Acad. Sci. USSR, Voprosy Ikhtiologii, 13 (4): 625-651 (translated from the Russian), regarded the yellow perch as a subspecies of the Eurasian perch, *Perca fluviatilis* Linnaeus. This question precipitated spirited debate in the Committee, and we do not know what ultimate decision may be achieved. There are some observable differences between perch from the two areas; other potentially useful characters have not been investigated carefully. Pending more extended study we retain the conventional specific separation of American and Eurasian populations.

COMMON NAME	OCCURRENCE	SCIENTIFIC NAME
Bluestripe darter	F	*Percina cymatotaenia* (Gilbert and Meek)
Gilt darter	F	*Percina evides* (Jordan and Copeland)
*Freckled darter	F	*Percina lenticula* Richards and Knapp
Longhead darter	F	*Percina macrocephala* (Cope)
Blackside darter	F	*Percina maculata* (Girard)
Longnose darter	F	*Percina nasuta* (Bailey)
Blackbanded darter	F	*Percina nigrofasciata* (Agassiz)
Stripeback darter	F	*Percina notogramma* (Raney and Hubbs)
Sharpnose darter	F	*Percina oxyrhyncha* (Hubbs and Raney)
Bronze darter	F	*Percina palmaris* (Bailey)
Leopard darter	F	*Percina pantherina* (Moore and Reeves)
Shield darter	F	*Percina peltata* (Stauffer)
Slenderhead darter	F	*Percina phoxocephala* (Nelson)
Roanoke logperch	F	*Percina rex* (Jordan and Evermann)
Dusky darter	F	*Percina sciera* (Swain)
River darter	F	*Percina shumardi* (Girard)
Olive darter	F	*Percina squamata* (Gilbert and Swain)
Stargazing darter	F	*Percina uranidea* (Jordan and Gilbert)
Sauger	F	*Stizostedion canadense* (Smith)
Walleye	F	*Stizostedion vitreum vitreum* (Mitchill)
Blue pike	F	*Stizostedion vitreum glaucum* Hubbs

Darters which have been described since the publication,

A list of Common and Scientific names of fishes from the U.S. and Canada,

Third edition, 1970.

Ammocrypta bifascia	Williams 1975
Ammocrypta meridiana	Williams 1975
Etheostoma barbouri	Kuehne and Small 1971
Etheostoma boschungi	Wall and Williams 1974
Etheostoma chlorobranchium	Zorach 1972
Percina macrolepida	Stevenson 1971
Percina (Imostoma) tanasi	Etnier 1976

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To be published in COPEIA as an appendix to the report on a National Plan for North American Ichthyology.

Appendix III

A List of Undescribed Freshwater Fish Species of Continental United States and Canada, with Additions to the 1970 Checklist.

By

Robert E. Jenkins

In the 1970 checklist, Bailey et al. recognized 621 species of freshwater fishes from the United States and Canada. Since that time, 107 more (14.7% of 728) have been described or elevated to species status, are now recognized to warrant resurrection or elevation to such status, are undescribed, or have been discovered in the United States (Table 1).

Table 1. - Total Numbers of Freshwater Fish Species of Continental United States and Canada

Number of Species	Percent of Total	Category
728	-	Total native freshwater or inland, excluding certain coastal euryhaline species more typical of saline waters.
621	85.3	From checklist (Bailey et al. 1970)
28	3.8	A = described since checklist
8	1.1	B = resurrected or elevated since checklist
59	8.1	C = undescribed
8	1.1	D = to be resurrected or elevated
3	0.4	E = discovered recently in Texas, not in checklist
1	.0.1	F = omitted from checklist
13	-	I = introduced into North American, but excluded from totals above (species of families Clariidae, Loricariidae. Cichlidae not included among the 13).

The following list was compiled beginning in 1967, and the present draft was completed in February 1976. An attempt was made on the basis of current knowledge to restrict the list to species. Some listed forms may actually be subspecies, but further study clearly is warranted for determination of taxonomic rank. One or more references (not cited herein) concerning description, distribution, and/or taxonomic status are given for many forms. Most references to an authority and year are to publications. Many undated references are to persons whose thesis is unpublished or who otherwise have studied the forms involved. Some forms for which an authority is not given have been studied sufficiently for enlistment, but future authorship is unclear.

List of Families, with Additions to Checklist of Bailey et al. (1970)
(Number directly following family is new total of native freshwater species. dr. = drainage; syst. = system. See Table for explanation of other symbols and numbers.)

PETROMYZONIDAE 18 (A4)
- A Lampetra lethophaga Hubbs 1971
- A Lampetra minima Bond and Kan 1973; recently extinct
- A Lampetra pacifica Vladykov 1973
- A Lampetra (Lethenteron) meridionale Vladykov, Kott and Pharand-Coad 1975

ACIPENSERIDAE 8 (C1)
- C Scaphirhynchus sp. Williams and Clemmer

POLYODONTIDAE 1
LEPISOSTEIDAE 5
AMIIDAE 1
ANGUILLIDAE 1
CLUPEIDAE 8
HIODONTIDAE 2
SALMONIDAE 42 (A2, B2, C1, F1) [11]
- F Coregonus canadensis Scott 1967
- A Salmo apache Miller 1972
- C Salmo sp. redband trout Behnke 1971, Miller 1972, Bond 1974
- B Salvelinus agassizi Garman 1885; Behnke 1972; recently extinct
- A Salvelinus anaktuvukensis Morrow 1973; but see McCart 1974
- B Salvelinus campbelli Suckley 1861; resurrected fide Miller

OSMERIDAE 6
UMBRIDAE 4
ESOCIDAE 5
CHARACIDAE 1
CYPRINIDAE 230 (A9, B4, C16, D3, E1) [16]
- A Campostoma oligolepis Hubbs and Greene 1935; Pflieger 1971
- A Endemichthys grandipinnis Hopkirk 1973; but see Hubbs 1974
- A Gila alvordensis Hubbs and Miller 1972
- B Gila intermedia (Girard) 1856; refs. in Minckley 1973
- E Gila pandora; Miller and Hubbs 1962; Texas
- B Hybognathus argyritis Girard 1856; Pflieger 1971
- B Hybognathus regius Girard 1856; Pflieger 1971
- A Hybopsis lineapunctata Clemmer and Suttkus 1971
- D Hybopsis zanema (Jordan and Brayton) 1878; Jenkins and Lachner
- C Hybopsis sp. cf. zanema Jenkins and Lachner
- D Hybopsis winchelli (Girard) 1856; Clemmer
- C Hybopsis sp. cf. winchelli Clemmer
- A Notropis atrapiculus Snelson 1972
- A Notropis gibbsi Howell and Williams 1971
- B Notropis isolepis Hubbs and Brown 1927; Menzel 1970
- A Notropis mekistocholas Snelson 1971
- D Notropis wickliffi Trautman 1931; Ramsey
- C Notropis sp. cf. hypselopterus Suttkus
- C Notropis sp. cf. procne Jenkins
- C Notropis sp. cf. rubellus
- C Notropis sp. cf. sabinae Suttkus
- C Notropis sp. cf. shumardi Suttkus
- C Notropis sp. cf. spectrunculus Ramsey
- C Notropis sp. cf. stramineus Williams
- C Notropis sp. cf. volucellus Ramsey
- C Notropis sp. cf. umbratilus Snelson
- C Notropis sp. cf. welaka Bailey; possibly extinct
- C Notropis sp. cf. welaka Bailey and Robison
- C Phoxinus sp. cf. oreas Starnes
- C Phoxinus sp.
- A Pogonichthys ciscoides Hopkirk 1973
- A Relictus solitarius Hubbs and Miller 1972
- C Semotilus sp. cf. atromaculatus Snelson and Suttkus

  [omitted from totals: Notropis chrysocephalus (see R. V. Miller 1968, Menzel 1970) and Notropis lepidus (see Hubbs 1972), which have been synonymized]

CATOSTOMIDAE 61 (A1, C2, E1)
- A Catostomus fumeiventris Miller 1973
- C Catostomus sp. Minckley 1973
- E Moxostoma austrinum; Jenkins, Miller; Texas
- C Moxostoma sp. cf. poecilurum Jenkins

ICTALURIDAE 40 (A1, C2)
- A Noturus taylori Douglas 1972
- C Noturus sp. cf. hildebrandi Etnier and Jenkins
- C Noturus sp. cf. leptacanthus Jenkins and Palmer

AMBLYOPSIDAE 6 (A1)
- A Speoplatyrhinus poulsoni Cooper and Kuehne 1974

APHREDODERIDAE 1
PERCOPSIDAE 2
GADIDAE 1
CYPRINODONTIDAE 47 (A3, B1, C4, E1)
E Cyprinodon eximius; Miller; Texas
A Cyprinodon milleri LaBounty and Deacon 1972
A Cyprinodon tularosa Miller and Echelle 1975
C Cyprinodon sp., Monkeyspring pupfish, Minckley 1973
C Cyprinodon sp., Devils River pupfish, Hubbs 1972
C Cyprinodon sp., Pecos River pupfish, Echelle and Miller 1972
A Fundulus blairae Wiley and Hall 1975
B Fundulus diaphanus Agassiz 1854; Griffith 1974, Wiley and Hall 1975
C Fundulus sp. cf. albolineatus Etnier, Ramsey, Williams
[omitted from total: Fundulus kansae, synonym of F. zebrinus (Drevry 1967)]
POECILIIDAE 13 (A1) [T6]
A Gambusia amistadensis Peden 1973 (now captive populations only)
ATHERINIDAE 4
GASTEROSTEIDAE 4
PERCICHTHYIDAE 4
CENTRARCHIDAE 35 (C4, D1)
D Ambloplites ariommus Viosca; Cashner
C Ambloplites sp. Cashner and Suttkus
C Elassoma sp. Bohlke
C Elassoma sp.
C Micropterus sp. Ramsey
PERCIDAE 148 (A6, B1, C26, D3)
A Ammocrypta bifascia Williams 1975
A Ammocrypta meridiana Williams 1975
A Etheostoma barbouri Kuehne and Small 1971
A Etheostoma boschungi Wall and Williams 1974
A Etheostoma chlorobranchium Zorach 1972
C Etheostoma (Catonotus) sp. cf. flabellare Jenkins
C Etheostoma (Catonotus) sp. cf. squamiceps Howell
C Etheostoma (Catonotus) sp. cf. squamiceps
C Etheostoma (Catonotus) sp. cf. virgatum Brassch and Page
D Etheostoma nasidia (Jordan and Evermann) 1898; Howell
C Etheostoma (Doration) sp. cf. stigmaeum Howell
C Etheostoma (Nothonotus) sp. cf. maculatum Williams and Etnier
C Etheostoma (Ulocentra) sp., Caney Fk., Bouchard
C Etheostoma (Ulocentra) sp., upper Cumberland, Ky. drs.
C Etheostoma (Ulocentra) sp., Barren syst.
C Etheostoma (Ulocentra) sp., Green syst.
C Etheostoma (Ulocentra) sp., W. lower Tenn., E. Miss. drs.
C Etheostoma (Ulocentra) sp., E. Miss. dr.
C Etheostoma (Ulocentra) sp., E. Miss. dr.
C Etheostoma (Ulocentra) sp., lower Tenn., Cumberland drs.
C Etheostoma (Ulocentra) sp., Coosa syst.
C Etheostoma (Ulocentra) sp., Tallapoosa syst.
C Etheostoma (Ulocentra) sp., Warrior syst.
C Etheostoma (Ulocentra) sp., E. Gulf slope
D Percina carbonaria (Baird and Girard) 1853
A Percina macrolepida Stevenson 1971

C Percina (Percina) sp. Etnier, Thompson
C Percina (Percina) sp. lowland E. Gulf slope
C Percina (Alvordius) sp. Ramsey and Williams
C Percina (Cottogaster) sp. Suttkus and Ramsey
C Percina (Hadropterus) sp. Denoncourt
D Percina oxyrhyncha (Jordan and Gilbert) 1887; Thompson and Cashner
C Percina (Imostoma) sp. Williams and Etnier
C Percina (Imostoma) sp. Etnier
C Percina (Odontopholis) sp. Bailey
B Percina roanoka (Jordan and Jenkins) 1888; Page 1974
SCIAENIDAE 1
CICHLIDAE 1 [I?]
COTTIDAE 28 (C3, D1)
D Cottus girardi Robins 1961
C Cottus sp., broadhead sculpin, Robins
C Cottus sp., Ozark sculpin, Robins
C Cottus sp., Tallapoosa sculpin, Williams

Reference

Bailey, R.M., J.E. Fitch, E.S. Herald, E.A. Lachner, C.C. Lindsey, C. Richard Robins, and W.B. Scott 1970. A list of Common and Scientific Names of Fishes from the United States and Canada. (Third Ed.). Am. Fish. Soc. Spec. Publ. No. 6, 149 p.

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Supreme Court of the United States

No. 76-1701

Tennessee Valley Authority,

Petitioner,

v.

Hiram G. Hill, Jr., et al.

ORDER ALLOWING CERTIORARI. Filed November 14, 1977

The petition herein for a writ of certiorari to the United States Court of Appeals for the Sixth ----------Circuit is granted.

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